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PRESSURE DISTRIBUTIONS OBTAINED ON A 0.04-SCALE AND 0.02-SCALE MODEL OF THE SPACE SHUTTLE ORBITER'S FORWARD FUSELAGE IN THE LANGLEY CONTINUOUS FLOW HYPERSONIC TUNNEL

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Pressure Distributions on a 0.04-Scale and 0.02-Scale Model of the Space Shuttle Orbiter's Forward Fuselage in the Langley Continuous Flow Hypersonic Tunnel

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Summary

Results from pressure distribution tests on 0.04-scale and 0.02-scale models of the forward fuselage of the Space Shuttle Orbiter are presented without analysis. The tests were completed in the Langley Continuous Flow Hypersonic Tunnel (CFHT). The 0.04-scale model was tested at angles of attack from -5° to 45° and angles of sideslip from -3° to 3°. The 0.02-scale model was tested at angles of attack from -10° to 45° and angles of sideslip from -5° to 5°.

The tests were conducted in support of the development of the Shuttle Entry Air Data System (SEADS). In addition to modeling the 20 SEADS pressure orifices, the wind-tunnel models were also instrumented with orifices to match Development Flight Instrumentation (DFI) port locations currently existing on the Space Shuttle Orbiter Columbia (OV-102). This DFI simulation has provided a means for comparisons between reentry flight pressure data and wind-tunnel data.

Introduction

The SEADS is an across-the-speed-range, flush-orifice air data system proposed for installation on the Space Shuttle Orbiter (ref. 1). The system consists of 20 pressure orifices, 14 of which are arranged in a cruciform pattern and are installed

in a baseline geometry nose cap assembly. The other six are located on the forward fuselage. An extensive flow-field model development program has been completed to define the algorithm which will enable researchers to convert the SEADS flight data into research quality air data. The data reduction algorithm is based on a modification of Newtonian theory, which entails the use of correction factors based on wind-tunnel data obtained across the Mach number range on various models of the orbiter's forward fuselage. The wind-tunnel data presented in this report are an important part of the SEADS data base at Mach 10 (refs. 2 and 3).

Data are presented for two different scale models of the forward fuselage--0.04-scale and 0.02-scale. The smaller model was constructed and tested after lower surface data from the 0.04-scale model at high angles of attack appeared to be influenced by shock reflections from the tunnel's floor. The 0.02-scale model data are free of this influence. Both the 0.02-scale and 0.04-scale model data--except for the high angle-of-attack 0.04-scale model data--have been incorporated into the SEADS data base at Mach 10.

These investigations were completed in the Mach 10 CFHT at the NASA Langley Research Center. The angle of attack was varied from -5° to 45° for the 0.04-scale model and -10° to 45° for the 0.02-scale model. The angle of sideslip was varied from -3° to 3° for the 0.04-scale model and -5° to 5° for the 0.02-scale model. The two models are of the forward fuselage region of the Space Shuttle Orbiter. The models extend back to the canopy

region and include scaled forward RCS jet scallops. The 0.04-scale model has 72 pressure orifices including SEADS, DFI, and SEADS support locations. The smaller 0.02-scale model has 36 pressure orifices including SEADS and DFI locations. The data are presented in plotted and tabular form.

Wind-Tunnel Facility

The tests were conducted in the Langley CFHT. The CFHT is a nominal Mach 10 air facility currently operated only in the blowdown mode. It has a 0.79 m (31-inch)-square test section with a 0.38 m (14-inch) test core at the Reynolds number tested (3.3×10^6/m). Its stagnation temperature is nominally 1000 K with a range in stagnation pressure from 1.7×10^6 Pa to 12.4×10^6 Pa, giving a free-stream Reynolds number range from 1.64×10^6/m to 8.25×10^6/m. The present tests were run at a nominal pressure of 4.2×10^6 Pa and a nominal Reynolds number of 3.3×10^6/m.

Models and Instrumentation

The two models tested were identical in construction except for their size. The 0.04-scale model was instrumented with 72 pressure orifices, with the orifice locations matching proposed SEADS, current DFI, and SEADS support locations. The 0.02-scale model was instrumented with 36 pressure orifices. These 36 were selected from the 72 locations on the 0.04-scale model. Those chosen were the SEADS array and the DFI. The reduced number was due to the smaller-sized model and its associated restricted areas for pressure tubing. Only the most critical orifices to SEADS algorithm development and comparison with current orbiter instrumentation were, therefore, modeled.

Both models were instrumented with two chromel-alumel thermocouples installed near the nose of each model. This instrumentation was necessary to monitor model temperatures during runs in the CFHT, in order to prevent the models from overheating. Photographs of the models are shown in figures 1 and 2. The models' coordinate system is shown in figure 3. Table I gives the orifice numbers and locations for the 0.04-scale model and table II, for the 0.02-scale model. The SEADS array of orifices is modeled by orifices 201 through 220 on both models. The DFI locations duplicated are listed in table III along with their corresponding model orifices. Both models were sting mounted from the back to the tunnel's injection plate.

Test Setup

Data were obtained from the orifices via Datametric absolute pressure transducers. The transducers are located behind the injection mechanism. This kept the transducers close to the model, thereby reducing settling times for each data point. Since there were only 20 transducers available, the 0.04-scale model required four hookup configurations (referred to as Conf 1-4 table IV) to collect data from all of the orifices; the 0.02-scale model required two hookups (referred to as Conf 1-2 table XIII). From three to seven data points were completed during a nominal 60-second blowdown run depending on orifice settling times. Each data point was one angle-of-attack/sideslip combination and is identified sequentially by the "Ref." number. Both models were also tested in the inverted position (roll = 180°) to determine any flow asymmetry in the tunnel. The

various data points tested are listed in table IV for the 2-percent model and table XIII for the 4-percent model.

Presentation of Results

To preserve data accuracy and for the convenience of the reader, the data are presented in tabular form. Tables V through XII give data for the 2-percent model and tables XIV through XIX for the 4-percent model. Data are presented in dimensional form (psia). Since these data are being used in both pressure coefficients and nondimensional forms P/Q and P/P_{t_2}, they are presented here in dimensional form along with enough tunnel information to provide the reader any nondimensional form. A limited amount of data is plotted in figures 4 through 9 to show trends. The influence of the shock reflections can be seen at high angle of attack in figures 6 and 7. These data are nondimensionalized by P_{t_2} as calculated from tunnel conditions. Some limited comparisons of the present data to flight data have been obtained. Reference 4 presents these comparisons at the time the orbiter passes through Mach 10 during its reentry.

List of Symbols

M_∞	free-stream Mach number
P_i	pressure at orifice "i," psia
P_{t_1}	tunnel stagnation pressure, psia
P_{t_2}	total pressure behind the shock, psia
P_∞	tunnel free-stream static pressure, psia
q_∞	tunnel free-stream dynamic pressure, psia
x,y,z	model coordinates, m
α	angle of attack, deg.
β	angle of sideslip, deg.
λ_i	orifice lateral angle, deg.
ϕ	model roll angle, deg.
ϕ_i	orifice longitudinal angle, deg.

References

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2. Bradley, P. F.; Siemers, P. M. III; Flanagan, P. F.; and Henry, M . W.: Pressure Distributions on a 0.04-Scale Model of the Space Shuttle Orbiter's Forward Fuselage in the Langley Unitary Plan Wind Tunnel. NASA TM-84628, March 1983.

3. Bradley, P. F.; Siemers, P. M. III; Flanagan, P. F.; and Henry, M. W.: Pressure Distributions on a 0.04-Scale and 0.02-Scale Model of the Space Shuttle Orbiter's Forward Fuselage in the Langley 20-Inch Mach 6 Air Tunnel. NASA TM-84629, March 1983.

4. Bradley, P. F.; Siemers, P. M. III; and Weilmuenster, K. J.: An Evaluation of Space Shuttle Orbiter Forward Fuselage Surface Pressures: Comparisons with Wind-Tunnel and Theoretical Predictions. AIAA Paper No. 83-0119, Jan. 1983.

Table I
0.04-Scale Model Orifice Locations

Orifice Number	X,m	Y,m	Z,m
02	.1880	.0000	.0362
05	.1879	-.0418	.0049
06	.1879	.0418	.0049
09	.1881	.00005	.0419
10	.1676	-.0001	-.0426
13	.1676	-.0508	.0041
14	.1676	.0508	.0041
17	.1717	-.0001	-.0504
19	.1270	-.0646	.0016
20	.1270	.0646	.0016
21	.0863	-.0761	-.0021
22	.0863	.0761	-.0021
23	.0457	-.0856	-.0072
24	.0457	.0856	-.0072
25	.0051	-.0938	-.0193
26	.0051	.0938	-.0193
43	.1721	-.0478	.0183
44	.1721	.0478	.0183
85	.1970	-.0338	.0062
86	.1970	.0338	.0062
87	.1880	-.0315	.0283
88	.1880	.0315	.0283
89	.0701	-.0315	.0553
90	.0701	.0315	.0553
91	.0701	.0000	.0570
92U	.1880	.0000	-.0355
92L	.1880	.0000	.0327
93	.1643	.0000	.0432
128	.0389	-.0019	-.1073
201	.2264	.0000	-.0094
202	.2280	.0000	-.0048
203	.2286	.0000	.0000
204	.2281	.0000	.0047
205	.2265	.0000	.0093
206	.2241	.0000	.0135
207	.2210	.0000	.0173
208	.2174	.0000	.0207
209	.2241	-.0137	.0041
210	.2263	-.0094	.0045
211	.2277	-.0048	.0047
212	.2277	.0048	.0047
213	.2263	.0094	.0045
214	.2241	.0137	.0041
215	.1958	-.0032	-.0380
216	.1959	-.0371	.0114
217	.1959	.0371	.0114
218	.1961	-.0053	.0329
219	.0862	-.0761	.0086
220	.0862	.0761	.0086
225	.1236	.0000	-.0723
226	.2134	.0000	-.0249
227	.2184	.0000	-.0208
228	.2235	.0000	-.0144
229	.2083	.0000	.0269
230	.1199	.0000	.0533
231	.2131	-.0256	.0026
232	.2207	-.0183	.0037
233	.2207	.0183	.0037
234	.2131	.0256	.0026
235	.1010	-.0692	.0294
236	.1004	-.0623	.0389
237	.0951	-.0415	.0503

Table I continued

Orifice Number	X,m	Y,m	Z,m
238	.0964	-.0264	.0529
239	.0953	-.0005	.0544
244	.0699	.0009	-.0945
245	.1009	.0010	-.0818
246	.1405	-.0602	-.0046
247	.0949	-.0737	.0181
248	.0383	-.0873	-.0333
249	.0383	.0873	-.0333
252	.2110	.0000	.0260

Table II
0.02-Scale Model Orifice Locations

Orifice Number	X,m	Y,m	Z,m
201	.1132	.0000	-.0047
202	.1140	.0000	-.0024
203	.1143	.0000	.0000
204	.1140	.0000	.0024
205	.1133	.0000	.0047
206	.1121	.0000	.0068
207	.1105	.0000	.0087
208	.1087	.0000	.0104
209	.1120	-.0069	.0021
210	.1131	-.0047	.0022
211	.1138	-.0024	.0023
212	.1138	.0024	.0023
213	.1131	.0047	.0022
214	.1120	.0069	.0021
215	.0979	-.0016	-.0189
216	.0982	-.0186	.0057
217	.0979	.0186	.0057
218	.0980	-.0027	.0165
219	.0431	-.0381	.0043
220	.0431	.0381	.0043
225	.0618	.0000	-.0361
227	.1092	.0000	-.0104
230	.0599	.0000	.0267
231	.1065	-.0128	.0013
234	.1065	.0128	.0013
235	.0505	-.0346	.0147
236	.0502	-.0311	.0195
237	.0475	-.0208	.0251
238	.0482	-.0132	.0264
239	.0477	-.0025	.0272
244	.0350	.0046	-.0473
245	.0504	.0051	-.0409
246	.0702	-.0301	-.0023
247	.0475	-.0369	.0090
248	.0191	-.0436	-.0167
249	.0191	.0436	-.0167

Table III
Corresponding Orbiter/Model Orifices

Orbiter DFI Designation	Model Orifice
V07P9100	218
V07P9451	218
V07P9453	239
V07P9455	238
V07P9457	237
V07P9459	236
V07P9461	235
V07P9801	215
V07P9805	225
V07P9807	245
V07P9810	244
V07P9871	216
V07P9873	247
V07P9877	246
V07P9887	248
V07P9888	249

Table IV: Data Summary - Continuous Flow Hypersonic Tunnel - 2% Model

Ref	Run	Conf	M_∞	α deg	β deg	ϕ deg	P_{t_1} psia	q_∞ psia	P_∞ psia	P_{t_2} psia
1	4	1	10.02	44.0	1.5	0	704.50	1.121	.016	2.112
2	4	1	10.02	40.0	1.5	0	709.90	1.128	.016	2.127
3	4	1	10.02	35.0	1.5	0	710.89	1.130	.016	2.132
4	4	1	10.02	30.0	1.5	0	710.23	1.130	.016	2.132
5	4	1	10.02	25.0	1.5	0	714.20	1.138	.017	2.144
6	5	1	10.02	20.1	1.5	0	714.42	1.144	.017	2.149
7	5	1	10.02	15.0	1.5	0	711.67	1.135	.016	2.110
8	5	1	10.02	10.1	1.5	0	712.33	1.134	.016	2.087
9	5	1	10.02	5.0	1.5	0	712.33	1.134	.016	2.070
10	5	1	10.02	.0	1.5	0	710.34	1.131	.016	2.060
11	5	1	10.02	-5.0	1.5	0	714.64	1.138	.016	2.077
12	5	1	10.02	-10.0	1.5	0	712.88	1.136	.016	2.079
13	6	1	10.02	45.0	3.0	0	705.93	1.125	.016	2.120
14	6	1	10.02	40.1	3.0	0	716.96	1.142	.017	2.152
15	6	1	10.02	35.0	3.0	0	716.41	1.142	.017	2.153
16	6	1	10.02	30.0	3.0	0	714.20	1.137	.017	2.145
17	6	1	10.02	25.1	3.0	0	714.64	1.138	.017	2.144
18	6	1	10.02	20.1	3.0	0	714.75	1.138	.016	2.143
19	7	1	10.02	15.1	3.0	0	725.89	1.159	.017	2.154
20	7	1	10.02	10.0	3.0	0	723.91	1.155	.016	2.124
21	7	1	10.02	4.9	3.0	0	721.81	1.151	.016	2.099
22	7	1	10.02	0.0	3.0	0	719.94	1.147	.016	2.089
23	7	1	10.02	-5.0	3.0	0	719.83	1.147	.016	2.093
24	7	1	10.02	-9.9	3.0	0	722.36	1.151	.016	2.106
25	10	1	10.02	-10.0	-.0	180	715.06	1.141	.016	2.097
26	10	1	10.02	-5.0	-.0	180	721.04	1.149	.016	2.096
27	10	1	10.02	-2.5	-.0	180	722.36	1.151	.016	2.098
28	10	1	10.02	0.0	-.0	180	720.93	1.149	.016	2.092
29	10	1	10.02	2.4	-.0	180	719.27	1.146	.016	2.089
30	10	1	10.02	5.0	-.0	180	720.82	1.148	.016	2.095
31	10	1	10.02	9.9	0.0	180	718.94	1.145	.016	2.096
32	11	1	10.02	45.1	0.0	0	716.19	1.139	.017	2.147
33	11	1	10.02	40.0	-.0	0	718.83	1.143	.017	2.155
34	11	1	10.02	34.9	0.0	0	722.14	1.150	.017	2.168
35	11	1	10.02	30.0	-.0	0	722.14	1.150	.017	2.170
36	11	1	10.02	25.0	0.0	0	722.91	1.151	.017	2.169
37	11	1	10.02	20.0	-.0	0	720.60	1.147	.017	2.159
38	12	1	10.02	15.1	-.0	0	716.63	1.139	.016	2.120
39	12	1	10.02	10.0	0.0	0	718.06	1.141	.016	2.101
40	12	1	10.02	5.0	-.0	0	715.97	1.138	.016	2.078
41	12	1	10.02	2.5	-.0	0	720.82	1.147	.016	2.091
42	12	1	10.02	.0	-.0	0	722.58	1.149	.016	2.094
43	12	1	10.02	-2.4	-.0	0	722.25	1.149	.016	2.096
44	12	1	10.02	-5.0	0.0	0	722.14	1.148	.016	2.097
45	12	1	10.02	-10.0	-.0	0	721.48	1.147	.016	2.101
46	13	1	10.02	45.0	5.0	0	721.15	1.149	.017	2.165
47	13	1	10.02	40.1	5.0	0	720.38	1.148	.017	2.162
48	13	1	10.02	35.0	5.0	0	723.02	1.151	.017	2.172
49	13	1	10.02	30.0	5.0	0	720.93	1.149	.017	2.166
50	13	1	10.02	25.0	5.0	0	720.93	1.149	.017	2.164
51	14	1	10.02	20.0	5.0	0	719.38	1.147	.017	2.158
52	14	1	10.02	15.0	5.0	0	720.71	1.148	.016	2.135
53	14	1	10.02	10.0	5.0	0	718.94	1.145	.016	2.107
54	14	1	10.02	5.0	5.0	0	718.28	1.145	.016	2.088
55	14	1	10.02	0.0	5.0	0	719.50	1.147	.016	2.088
56	14	1	10.02	-5.0	5.0	0	717.51	1.144	.016	2.087
57	14	1	10.02	-10.0	5.0	0	718.83	1.145	.016	2.096
58	15	1	10.02	45.1	-5.0	0	719.05	1.147	.017	2.160
59	15	1	10.02	40.0	-5.0	0	720.49	1.148	.017	2.163
60	15	1	10.02	35.0	-5.0	0	722.58	1.152	.017	2.172
61	15	1	10.02	30.0	-5.0	0	721.04	1.150	.017	2.167
62	15	1	10.02	25.1	-5.0	0	721.81	1.150	.017	2.166

Table IV(continued)

Ref	Run	Conf	M_∞	α deg	β deg	ϕ deg	P_{t_1} psia	q_∞ psia	P_∞ psia	P_{t_2} psia
63	16	1	10.02	20.0	-5.0	0	714.75	1.141	.017	2.145
64	16	1	10.02	15.0	-5.0	0	722.91	1.151	.016	2.142
65	16	1	10.02	10.0	-5.0	0	727.44	1.158	.016	2.131
66	16	1	10.02	5.0	-5.0	0	725.12	1.155	.016	2.108
67	16	1	10.02	.0	-5.0	0	717.73	1.143	.016	2.082
68	16	1	10.02	-5.0	-5.0	0	719.38	1.145	.016	2.090
69	16	1	10.02	-10.0	-5.0	0	716.96	1.141	.016	2.089
70	17	1	10.02	45.0	-3.0	0	716.63	1.138	.017	2.146
71	17	1	10.02	40.1	-3.0	0	718.50	1.141	.017	2.152
72	17	1	10.02	35.1	-3.0	0	717.29	1.140	.017	2.152
73	17	1	10.02	30.0	-3.0	0	719.27	1.143	.017	2.158
74	17	1	10.02	25.0	-3.0	0	718.28	1.141	.017	2.152
75	18	1	10.02	20.1	-3.0	0	721.04	1.149	.017	2.163
76	18	1	10.02	15.0	-3.0	0	716.08	1.141	.016	2.122
77	18	1	10.02	10.1	-3.0	0	716.63	1.142	.016	2.100
78	18	1	10.02	4.9	-3.0	0	715.86	1.141	.016	2.081
79	18	1	10.02	0.0	-3.0	0	715.97	1.141	.016	2.077
80	18	1	10.02	-5.0	-3.0	0	722.36	1.151	.016	2.100
81	18	1	10.02	-9.9	-3.0	0	722.03	1.150	.016	2.106
82	19	1	10.02	45.1	-1.5	0	721.37	1.148	.017	2.164
83	19	1	10.02	40.1	-1.5	0	720.82	1.148	.017	2.163
84	19	1	10.02	35.0	-1.5	0	720.93	1.149	.017	2.166
85	19	1	10.02	30.0	-1.5	0	721.04	1.148	.017	2.166
86	19	1	10.02	25.1	-1.5	0	720.49	1.147	.017	2.162
87	20	1	10.02	20.0	-1.5	0	712.33	1.135	.016	2.136
88	20	1	10.02	15.0	-1.5	0	722.47	1.149	.016	2.139
89	20	1	10.02	10.1	-1.5	0	723.02	1.152	.016	2.119
90	20	1	10.02	5.0	-1.5	0	721.26	1.150	.016	2.098
91	20	1	10.02	.0	-1.5	0	722.58	1.152	.016	2.098
92	20	1	10.02	-5.0	-1.5	0	723.35	1.153	.016	2.104
93	21	2	10.02	45.0	0.0	0	720.60	1.151	.017	2.166
94	21	2	10.02	40.0	0.0	0	718.28	1.145	.017	2.157
95	21	2	10.02	35.1	0.0	0	716.19	1.141	.017	2.152
96	21	2	10.02	30.0	0.0	0	715.08	1.139	.017	2.148
97	21	2	10.02	25.1	0.0	0	718.06	1.144	.017	2.155
98	22	2	10.02	20.0	0.0	0	715.30	1.140	.017	2.145
99	22	2	10.02	15.0	0.0	0	720.82	1.148	.016	2.136
100	22	2	10.02	10.1	0.0	0	720.27	1.149	.016	2.112
101	22	2	10.02	5.0	0.0	0	718.83	1.146	.016	2.090
102	23	2	10.02	.1	0.0	0	722.25	1.152	.016	2.097
103	23	2	10.02	-4.9	0.0	0	721.26	1.149	.016	2.097
104	23	2	10.02	-10.1	0.0	0	723.02	1.152	.016	2.109
105	24	2	10.02	45.1	1.5	0	720.05	1.145	.017	2.159
106	24	2	10.02	40.0	1.5	0	723.02	1.152	.017	2.170
107	24	2	10.02	35.1	1.5	0	720.71	1.148	.017	2.165
108	25	2	10.02	30.0	1.5	0	715.53	1.139	.017	2.149
109	25	2	10.02	25.1	1.5	0	720.38	1.149	.017	2.164
110	25	2	10.02	20.0	1.5	0	719.38	1.145	.017	2.156
111	26	2	10.02	15.0	1.5	0	721.37	1.149	.016	2.137
112	26	2	10.02	10.1	1.5	0	717.29	1.143	.016	2.103
113	27	2	10.02	5.0	1.5	0	722.47	1.155	.016	2.105
114	27	2	10.02	0.0	1.5	0	723.35	1.155	.016	2.102
115	27	2	10.02	-5.0	1.5	0	720.60	1.150	.016	2.098
116	27	2	10.02	-9.9	1.5	0	721.26	1.149	.016	2.103
117	28	2	10.02	45.0	-1.5	0	713.65	1.136	.016	2.141
118	28	2	10.02	40.0	-1.5	0	717.95	1.143	.017	2.154
119	28	2	10.02	35.1	-1.5	0	716.85	1.141	.017	2.153
120	29	2	10.02	30.0	-1.5	0	715.30	1.138	.017	2.146
121	29	2	10.02	20.0	-1.5	0	718.94	1.146	.017	2.157
122	29	2	10.02	10.0	-1.5	0	717.95	1.144	.016	2.104
123	30	2	10.02	0.0	-1.5	0	714.53	1.141	.016	2.076
124	30	2	10.02	-9.9	-1.5	0	719.83	1.147	.016	2.100

Table IV(continued)

Ref	Run	Conf	M_∞	α deg	β deg	ϕ deg	P_{t_1} psia	q_∞ psia	P_∞ psia	P_{t_2} psia
125	31	2	10.02	45.0	3.0	0	717.18	1.142	.017	2.152
126	31	2	10.02	40.0	3.0	0	720.93	1.148	.017	2.163
127	31	2	10.02	35.1	3.0	0	723.69	1.153	.017	2.174
128	32	2	10.02	30.0	3.0	0	721.04	1.149	.017	2.166
129	32	2	10.02	25.0	3.0	0	721.26	1.149	.017	2.165
130	32	2	10.02	20.1	3.0	0	718.61	1.145	.017	2.155
131	33	2	10.02	15.1	3.0	0	717.95	1.144	.016	2.128
132	33	2	10.02	10.0	3.0	0	729.20	1.161	.016	2.136
133	33	2	10.02	5.1	3.0	0	721.70	1.150	.016	2.098
134	34	2	10.02	0.0	3.0	0	717.51	1.142	.016	2.081
135	34	2	10.02	−5.0	3.0	0	715.86	1.139	.016	2.080
136	34	2	10.02	−10.0	3.0	0	720.05	1.148	.016	2.101
137	35	2	10.02	45.1	5.0	0	714.53	1.134	.016	2.139
138	35	2	10.02	40.0	5.0	0	720.93	1.147	.017	2.162
139	35	2	10.02	35.0	5.0	0	722.25	1.149	.017	2.167
140	36	2	10.02	30.0	5.0	0	718.17	1.144	.017	2.158
141	36	2	10.02	25.0	5.0	0	719.38	1.146	.017	2.159
142	36	2	10.02	20.1	5.0	0	719.61	1.146	.017	2.157
143	37	2	10.02	15.0	5.0	0	719.05	1.140	.016	2.124
144	37	2	10.02	10.0	5.0	0	720.49	1.147	.016	2.111
145	37	2	10.02	5.1	5.0	0	720.71	1.148	.016	2.095
146	38	2	10.02	0.0	5.0	0	719.27	1.147	.016	2.088
147	38	2	10.02	−4.9	5.0	0	720.38	1.149	.016	2.095
148	38	2	10.02	−10.0	5.0	0	720.71	1.148	.016	2.101
149	40	2	10.02	25.0	−1.5	0	720.60	1.148	.017	2.163
150	40	2	10.02	15.0	−1.5	0	720.16	1.147	.016	2.134
151	40	2	10.02	5.0	−1.5	0	719.72	1.146	.016	2.092
152	41	2	10.02	−5.0	−1.5	0	717.51	1.141	.016	2.083
153	41	2	10.02	−5.0	−3.0	0	722.36	1.149	.016	2.098
154	41	2	10.02	−5.0	−5.0	0	722.91	1.151	.016	2.101
155	42	2	10.02	45.0	−3.0	0	718.50	1.145	.017	2.156
156	42	2	10.02	40.1	−3.0	0	717.73	1.142	.017	2.152
157	42	2	10.02	35.1	−3.0	0	719.05	1.146	.017	2.161
158	43	2	10.02	30.0	−3.0	0	724.13	1.152	.017	2.174
159	43	2	10.02	25.0	−3.0	0	720.16	1.147	.017	2.161
160	43	2	10.02	20.0	−3.0	0	721.70	1.149	.017	2.164
161	44	2	10.02	15.0	−3.0	0	717.84	1.144	.016	2.127
162	44	2	10.02	10.0	−3.0	0	717.18	1.144	.016	2.103
163	44	2	10.02	5.0	−3.0	0	716.74	1.143	.016	2.085
164	45	2	10.02	−10.0	−3.0	0	724.57	1.155	.016	2.114
165	45	2	10.02	0.0	−3.0	0	722.47	1.153	.016	2.098
166	46	2	10.02	45.1	−5.0	0	721.37	1.148	.017	2.164
167	46	2	10.02	40.1	−5.0	0	723.24	1.153	.017	2.172
168	46	2	10.02	35.0	−5.0	0	723.24	1.152	.017	2.173
169	47	2	10.02	30.1	−5.0	0	721.15	1.149	.017	2.167
170	47	2	10.02	25.0	−5.0	0	722.25	1.151	.017	2.168
171	47	2	10.02	20.0	−5.0	0	720.49	1.148	.017	2.160
172	48	2	10.02	15.1	−5.0	0	718.39	1.144	.016	2.128
173	48	2	10.02	10.0	−5.0	0	718.17	1.145	.016	2.105
174	48	2	10.02	5.0	−5.0	0	717.51	1.143	.016	2.085
175	49	2	10.02	0.0	−5.0	0	717.84	1.144	.016	2.084
176	49	2	10.02	−9.9	−5.0	0	716.19	1.141	.016	2.086

Table V: Continuous Flow Hypersonic Tunnel - 2% Model
Nominal Conditions: β = 0.0°, M_∞ = 10.0, Inverted, Pressures in psia

Orifice ID	Nominal α													
	-10.0°		-5.0°		-2.5°		0.0°		2.5°		5.0°		10.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
201	25	2.018	26	1.915	27	1.858	28	1.792	29	1.724	30	1.654	31	1.494
202	25	2.109	26	2.065	27	2.033	28	1.988	29	1.937	30	1.885	31	1.752
203	25	2.061	26	2.100	27	2.107	28	2.098	29	2.085	30	2.075	31	2.022
204	25	1.784	26	1.919	27	1.976	28	2.012	29	2.039	30	2.065	31	2.103
205	25	1.373	26	1.553	27	1.641	28	1.709	29	1.771	30	1.837	31	1.959
206	25	.975	26	1.183	27	1.292	28	1.377	29	1.460	30	1.547	31	1.723
207	25	.750	26	.934	27	1.037	28	1.129	29	1.217	30	1.315	31	1.508
208	25	.591	26	.760	27	.859	28	.944	29	1.031	30	1.127	31	1.320
209	25	1.324	26	1.398	27	1.429	28	1.447	29	1.459	30	1.474	31	1.488
210	25	1.570	26	1.676	27	1.722	28	1.748	29	1.767	30	1.787	31	1.812
211	25	1.697	26	1.827	27	1.882	28	1.915	29	1.940	30	1.967	31	2.003
212	25	1.705	26	1.833	27	1.887	28	1.921	29	1.947	30	1.974	31	2.012
213	25	1.548	26	1.641	27	1.680	28	1.703	29	1.718	30	1.738	31	1.754
214	25	1.369	26	1.440	27	1.468	28	1.483	29	1.492	30	1.502	31	1.506
215	25	.857	26	.776	27	.685	28	.621	29	.552	30	.499	31	.401
216	25	.479	26	.545	27	.577	28	.594	29	.611	30	.626	31	.650
217	25	.386	26	.466	27	.508	28	.528	29	.545	30	.558	31	.583
218	25	.201	26	.251	27	.317	28	.369	29	.431	30	.492	31	.656
219	25	.186	26	.184	27	.184	28	.184	29	.185	30	.186	31	.190
220	25	.179	26	.173	27	.170	28	.170	29	.170	30	.171	31	.174
239	25	.154	26	.136	27	.125	28	.121	29	.121	30	.124	31	.151
246	25	.244	26	.260	27	.264	28	.264	29	.264	30	.262	31	.257

Table VI: Continuous Flow Hypersonic Tunnel - 2% Model
Nominal Conditions: β = 0.0°, M_∞ = 10.0, Upright, Pressures in psia

Orifice	Nominal α													
	-10.0°		-5.0°		-2.5°		0.0°		2.5°		5.0°		10.0°	
ID	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
201	45	2.018	44	1.928	43	1.874	42	1.817	41	1.750	40	1.677	39	1.516
202	45	2.093	44	2.061	43	2.035	42	2.003	41	1.959	40	1.906	39	1.778
203	45	2.034	44	2.079	43	2.092	42	2.101	41	2.097	40	2.088	39	2.055
204	45	1.758	44	1.886	43	1.944	42	1.999	41	2.035	40	2.068	39	2.126
205	45	1.362	44	1.523	43	1.606	42	1.689	41	1.757	40	1.827	39	1.971
206	45	1.005	44	1.171	43	1.263	42	1.360	41	1.444	40	1.534	39	1.725
207	45	.758	44	.917	43	1.009	42	1.107	41	1.195	40	1.290	39	1.496
208	45	.604	44	.747	43	.829	42	.921	41	1.005	40	1.096	39	1.297
209	45	1.257	44	1.329	43	1.362	42	1.393	41	1.411	40	1.429	39	1.458
210	45	1.528	44	1.622	43	1.664	42	1.705	41	1.732	40	1.758	39	1.796
211	45	1.667	44	1.782	43	1.835	42	1.885	41	1.919	40	1.952	39	2.006
212	45	1.706	44	1.825	43	1.879	42	1.930	41	1.965	40	1.997	39	2.055
213	45	1.557	44	1.652	43	1.694	42	1.731	41	1.757	40	1.779	39	1.818
214	45	1.400	44	1.470	43	1.499	42	1.527	41	1.542	40	1.555	39	1.576
215	45	.916	44	.736	43	.642	42	.543	41	.455	40	.369	39	.257
216	45	.476	44	.515	43	.536	42	.557	41	.572	40	.588	39	.610
217	45	.512	44	.543	43	.562	42	.580	41	.594	40	.607	39	.614
218	45	.269	44	.321	43	.363	42	.414	41	.466	40	.533	39	.681
219	45	.167	44	.170	43	.173	42	.177	41	.180	40	.184	39	.191
220	45	.178	44	.181	43	.183	42	.186	41	.189	40	.193	39	.199
225	104	.674	103	.494			102	.344			101	.220	100	.133
227	104	1.466	103	1.273			102	1.086			101	.895	100	.704
230	104	.093	103	.107			102	.133			101	.180	100	.280
231	104	.836	103	.859			102	.876			101	.885	100	.876
234	104	.890	103	.908			102	.922			101	.929	100	.922
235	104	.136	103	.151			102	.172			101	.200	100	.237
236	104	.107	103	.123			102	.149			101	.190	100	.267
237	104	.088	103	.101			102	.130			101	.174	100	.273
238	104	.083	103	.093			102	.122			101	.160	100	.252
239	45	.123	44	.134	43	.147	42	.164	41	.181	40	.203	39	.238
244	104	.712	103	.511			102	.347			101	.211	100	.114
245	104	.689	103	.500			102	.344			101	.217	100	.118
246	45	.247	44	.241	43	.237	42	.233	41	.229	40	.225	39	.217
247	104	.153	103	.162			102	.178			101	.187	100	.199
248	104	.156	103	.153			102	.158			101	.134	100	.135
249	104	.167	103	.162			102	.164			101	.145	100	.143

Table VI(continued)

Nominal Conditions: $\beta =$ 0.0°, $M_\infty =$ 10.0, Upright, Pressures in psia

Orifice ID	Nominal α 15.0° Ref	15.0° Pi	20.0° Ref	20.0° Pi	25.0° Ref	25.0° Pi	30.0° Ref	30.0° Pi	35.0° Ref	35.0° Pi	40.0° Ref	40.0° Pi	45.0° Ref	45.0° Pi
201	38	1.341	37	1.148	36	.946	35	.762	34	.606	33	.473	32	.441
202	38	1.624	37	1.445	36	1.234	35	1.027	34	.842	33	.669	32	.615
203	38	1.972	37	1.847	36	1.688	35	1.505	34	1.307	33	1.090	32	.914
204	38	2.141	37	2.120	36	2.046	35	1.929	34	1.776	33	1.583	32	1.399
205	38	2.076	37	2.145	36	2.162	35	2.135	34	2.058	33	1.925	32	1.766
206	38	1.889	37	2.032	36	2.121	35	2.155	34	2.150	33	2.095	32	2.006
207	38	1.691	37	1.871	36	2.009	35	2.098	34	2.149	33	2.149	32	2.117
208	38	1.495	37	1.696	36	1.864	35	1.992	34	2.088	33	2.137	32	2.148
209	38	1.455	37	1.420	36	1.359	35	1.270	34	1.161	33	1.030	32	.907
210	38	1.796	37	1.764	36	1.690	35	1.584	34	1.456	33	1.294	32	1.158
211	38	2.016	37	1.994	36	1.920	35	1.807	34	1.664	33	1.483	32	1.324
212	38	2.070	37	2.049	36	1.976	35	1.861	34	1.713	33	1.527	32	1.356
213	38	1.816	37	1.779	36	1.700	35	1.587	34	1.447	33	1.279	32	1.112
214	38	1.562	37	1.523	36	1.444	35	1.340	34	1.219	33	1.074	32	.948
215	38	.224	37	.144	36	.128	35	.126	34	.132	33	.147	32	.171
216	38	.603	37	.620	36	.605	35	.585	34	.561	33	.530	32	.507
217	38	.571	37	.659	36	.645	35	.624	34	.598	33	.562	32	.528
218	38	.793	37	1.007	36	1.219	35	1.419	34	1.608	33	1.773	32	1.909
219	38	.196	37	.183	36	.181	35	.181	34	.182	33	.186	32	.191
220	38	.202	37	.199	36	.197	35	.195	34	.194	33	.195	32	.198
225	99	.121	98	.127	97	.090	96	.092	95	.097	94	.108	93	.124
227	99	.561	98	.429	97	.305	96	.218	95	.161	94	.139	93	.149
230	99	.352	98	.455	97	.641	96	.802	95	.994	94	1.186	93	1.381
231	99	.854	98	.803	97	.754	96	.700	95	.634	94	.564	93	.509
234	99	.903	98	.861	97	.811	96	.752	95	.681	94	.607	93	.543
235	99	.257	98	.257	97	.335	96	.367	95	.399	94	.421	93	.404
236	99	.317	98	.376	97	.489	96	.576	95	.670	94	.758	93	.832
237	99	.335	98	.409	97	.603	96	.752	95	.922	94	1.096	93	1.257
238	99	.319	98	.396	97	.592	96	.746	95	.931	94	1.121	93	1.306
239	38	.251	37	.467	36	.629	35	.790	34	.952	33	1.143	32	1.304
244	99	.095	98	.098	97	.061	96	.062	95	.068	94	.076	93	.092
245	99	.097	98	.099	97	.062	96	.062	95	.067	94	.076	93	.092
246	38	.209	37	.218	36	.214	35	.211	34	.208	33	.203	32	.201
247	99	.201	98	.199	97	.209	96	.213	95	.216	94	.216	93	.211
248	99	.139	98	.150	97	.134	96	.138	95	.145	94	.153	93	.162
249	99	.146	98	.154	97	.146	96	.150	95	.154	94	.161	93	.168

Table VII: Continuous Flow Hypersonic Tunnel - 2% Model

Nominal Conditions: $\beta = 1.5^{o}$, $M_{\infty} = 10.0$, Upright, Pressures in psia

Orifice ID	Nominal α											
	-10.0°		-5.0°		0.0°		5.0°		10.0°		15.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
201	12	2.001	11	1.917	10	1.801	9	1.676	8	1.520	7	1.345
202	12	2.069	11	2.040	10	1.976	9	1.896	8	1.775	7	1.622
203	12	2.006	11	2.058	10	2.070	9	2.079	8	2.045	7	1.965
204	12	1.725	11	1.860	10	1.962	9	2.057	8	2.114	7	2.128
205	12	1.330	11	1.494	10	1.650	9	1.812	8	1.951	7	2.054
206	12	.980	11	1.145	10	1.325	9	1.520	8	1.700	7	1.862
207	12	.747	11	.894	10	1.073	9	1.273	8	1.474	7	1.661
208	12	.589	11	.729	10	.895	9	1.087	8	1.281	7	1.472
209	12	1.201	11	1.272	10	1.327	9	1.378	8	1.404	7	1.400
210	12	1.478	11	1.573	10	1.649	9	1.718	8	1.754	7	1.756
211	12	1.622	11	1.740	10	1.833	9	1.922	8	1.973	7	1.986
212	12	1.687	11	1.812	10	1.909	9	2.000	8	2.058	7	2.074
213	12	1.581	11	1.684	10	1.757	9	1.826	8	1.866	7	1.867
214	12	1.414	11	1.491	10	1.542	9	1.591	8	1.613	7	1.602
215	12	.918	11	.729	10	.527	9	.370	8	.280	7	.236
216	12	.443	11	.478	10	.515	9	.548	8	.567	7	.574
217	12	.537	11	.572	10	.613	9	.650	8	.673	7	.680
218	12	.264	11	.318	10	.408	9	.521	8	.644	7	.784
219	12	.156	11	.160	10	.166	9	.171	8	.178	7	.187
220	12	.196	11	.200	10	.206	9	.212	8	.217	7	.222
225	116	.653	115	.489	114	.322	113	.214	112	.151	111	.135
227	116	1.450	115	1.274	114	1.084	113	.894	112	.715	111	.566
230	116	.099	115	.112	114	.137	113	.152	112	.239	111	.329
231	116	.784	115	.807	114	.825	113	.816	112	.821	111	.801
234	116	.944	115	.965	114	.979	113	.983	112	.972	111	.953
235	116	.128	115	.140	114	.154	113	.158	112	.199	111	.219
236	116	.111	115	.122	114	.144	113	.155	112	.218	111	.276
237	116	.097	115	.106	114	.126	113	.138	112	.213	111	.289
238	116	.085	115	.096	114	.117	113	.130	112	.202	111	.439
239	12	.140	11	.156	10	.185	9	.220	8	.267	7	.317
244	116	.685	115	.499	114	.320	113	.194	112	.130	111	.106
245	116	.674	115	.501	114	.332	113	.212	112	.139	111	.109
246	12	.225	11	.218	10	.212	9	.208	8	.205	7	.204
247	116	.139	115	.144	114	.150	113	.150	112	.176	111	.188
248	116	.135	115	.131	114	.129	113	.130	112	.122	111	.143
249	116	.186	115	.176	114	.163	113	.154	112	.159	111	.166

Table VII(continued)

Nominal Conditions: β = 1.5°, M_∞ = 10.0, Upright, Pressures in psia

Ori- fice ID	Nominal α											
	20.0°		25.0°		30.0°		35.0°		40.0°		45.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
201	6	1.169	5	.966	4	.764	3	.616	2	.479	1	.452
202	6	1.459	5	1.249	4	1.022	3	.847	2	.672	1	.626
203	6	1.855	5	1.687	4	1.490	3	1.305	2	1.095	1	.948
204	6	2.118	5	2.035	4	1.906	3	1.766	2	1.583	1	1.430
205	6	2.132	5	2.140	4	2.104	3	2.038	2	1.916	1	1.785
206	6	2.009	5	2.089	4	2.121	3	2.123	2	2.078	1	2.001
207	6	1.843	5	1.974	4	2.063	3	2.117	2	2.127	1	2.096
208	6	1.669	5	1.825	4	1.955	3	2.053	2	2.108	1	2.113
209	6	1.377	5	1.306	4	1.213	3	1.115	2	.996	1	.897
210	6	1.732	5	1.649	4	1.534	3	1.418	2	1.264	1	1.154
211	6	1.971	5	1.888	4	1.764	3	1.635	2	1.462	1	1.331
212	6	2.063	5	1.985	4	1.858	3	1.723	2	1.543	1	1.399
213	6	1.838	5	1.754	4	1.628	3	1.497	2	1.335	1	1.194
214	6	1.568	5	1.490	4	1.374	3	1.259	2	1.117	1	1.005
215	6	.236	5	.133	4	.132	3	.139	2	.158	1	.182
216	6	.562	5	.558	4	.535	3	.516	2	.489	1	.470
217	6	.642	5	.690	4	.663	3	.640	2	.600	1	.569
218	6	.938	5	1.173	4	1.381	3	1.568	2	1.732	1	1.836
219	6	.197	5	.163	4	.165	3	.168	2	.176	1	.184
220	6	.224	5	.218	4	.214	3	.212	2	.212	1	.213
225	110	.094	109	.097	108	.114	107	.085	106	.091	105	.103
227	110	.432	109	.327	108	.255	107	.157	106	.131	105	.129
230	110	.478	109	.635	108	.801	107	1.008	106	1.203	105	1.387
231	110	.765	109	.724	108	.664	107	.599	106	.545	105	.492
234	110	.914	109	.863	108	.792	107	.719	106	.644	105	.562
235	110	.266	109	.295	108	.308	107	.378	106	.404	105	.420
236	110	.365	109	.451	108	.534	107	.642	106	.727	105	.802
237	110	.434	109	.570	108	.710	107	.913	106	1.080	105	1.244
238	110	.426	109	.569	108	.720	107	.933	106	1.120	105	1.303
239	6	.333	5	.578	4	.762	3	.919	2	1.112	1	1.230
244	110	.070	109	.070	108	.084	107	.052	106	.058	105	.068
245	110	.072	109	.071	108	.084	107	.057	106	.062	105	.073
246	6	.203	5	.195	4	.193	3	.191	2	.189	1	.189
247	110	.183	109	.185	108	.189	107	.205	106	.210	105	.215
248	110	.119	109	.128	108	.144	107	.133	106	.139	105	.150
249	110	.154	109	.157	108	.165	107	.164	106	.168	105	.175

Table VIII: Continuous Flow Hypersonic Tunnel - 2% Model
Nominal Conditions: $\beta = -1.5^o$, $M_\infty =$ 10.0, Upright, Pressures in psia

Orifice ID	Nominal α											
	-10.0°		-5.0°		0.0°		5.0°		10.0°		15.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
201			92	1.931	91	1.818	90	1.690	89	1.534	88	1.352
202	124	2.093	92	2.065	91	2.002	90	1.919	89	1.800	88	1.638
203	124	2.030	92	2.089	91	2.103	90	2.106	89	2.079	88	1.992
204	124	1.739	92	1.897	91	2.001	90	2.088	89	2.154	88	2.164
205	124	1.349	92	1.532	91	1.689	90	1.843	89	1.997	88	2.099
206	124	.987	92	1.180	91	1.363	90	1.549	89	1.749	88	1.913
207	124	.753	92	.901	91	1.086	90	1.281	89	1.498	88	1.691
208	124	.592	92	.756	91	.928	90	1.115	89	1.324	88	1.520
209			92	1.386	91	1.444	90	1.492	89	1.527	88	1.520
210			92	1.667	91	1.744	90	1.810	89	1.860	88	1.857
211			92	1.814	91	1.910	90	1.992	89	2.057	88	2.065
212			92	1.814	91	1.911	90	1.994	89	2.060	88	2.071
213			92	1.626	91	1.698	90	1.759	89	1.802	88	1.796
214			92	1.428	91	1.478	90	1.518	89	1.544	88	1.528
215			92	.736	91	.548	90	.403	89	.284	88	.218
216			92	.558	91	.601	90	.636	89	.665	88	.674
217			92	.511	91	.543	90	.571	89	.596	88	.600
218			92	.336	91	.424	90	.529	89	.674	88	.823
219			92	.191	91	.196	90	.201	89	.206	88	.210
220			92	.078	91	.078	90	.079	89	.084	88	.101
225	124	.661	152	.484	123	.319	151	.216	122	.131	150	.115
227	124	1.448	152	1.267	123	1.071	151	.898	122	.715	150	.567
230	124	.104	152	.122	123	.137	151	.192	122	.279	150	.352
231	124	.892	152	.904	123	.905	151	.947	122	.936	150	.915
234	124	.837	152	.851	123	.860	151	.878	122	.871	150	.854
235	124	.151	152	.163	123	.178	151	.226	122	.269	150	.291
236	124	.120	152	.136	123	.156	151	.214	122	.285	150	.342
237	124	.103	152	.125	123	.138	151	.194	122	.285	150	.351
238	124	.097	152	.118	123	.130	151	.177	122	.259	150	.329
239	124	.096	92	.146	91	.171	90	.206	89	.264	88	.327
244	124	.687	152	.486	123	.316	151	.187	122	.109	150	.074
245	124	.680	152	.493	123	.330	151	.212	122	.120	150	.092
246			92	.273	91	.263	90	.258	89	.252	88	.244
247	124	.171	152	.179	123	.182	151	.208	122	.224	150	.222
248	124	.174	152	.173	123	.167	151	.148	122	.145	150	.144
249	124	.151	152	.156	123	.153	151	.130	122	.129	150	.131

Table VIII(continued)

Nominal Conditions: $\beta = -1.5^{o}$, $M_{\infty} =$ 10.0, Upright, Pressures in psia

Ori-fice ID	Nominal α											
	20.0°		25.0°		30.0°		35.0°		40.0°		45.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
201	87	1.153	86	.945	85	.775	84	.614	83	.478	82	.419
202	87	1.444	86	1.230	85	1.040	84	.850	83	.677	82	.589
203	87	1.846	86	1.686	85	1.510	84	1.308	83	1.098	82	.908
204	87	2.114	86	2.046	85	1.933	84	1.779	83	1.594	82	1.399
205	87	2.134	86	2.162	85	2.138	84	2.062	83	1.936	82	1.773
206	87	2.021	86	2.125	85	2.158	84	2.157	83	2.110	82	2.017
207	87	1.837	86	2.015	85	2.103	84	2.156	83	2.165	82	2.132
208	87	1.685	86	1.872	85	1.997	84	2.097	83	2.154	82	2.165
209	87	1.469	86	1.405	85	1.315	84	1.199	83	1.068	82	.933
210	87	1.802	86	1.728	85	1.625	84	1.490	83	1.333	82	1.174
211	87	2.014	86	1.944	85	1.835	84	1.689	83	1.514	82	1.333
212	87	2.020	86	1.953	85	1.845	84	1.699	83	1.523	82	1.339
213	87	1.734	86	1.662	85	1.556	84	1.419	83	1.260	82	1.095
214	87	1.466	86	1.396	85	1.302	84	1.185	83	1.052	82	.921
215	87	.204	86	.122	85	.120	84	.124	83	.140	82	.166
216	87	.658	86	.651	85	.629	84	.602	83	.569	82	.536
217	87	.558	86	.605	85	.589	84	.569	83	.541	82	.506
218	87	.990	86	1.236	85	1.428	84	1.627	83	1.799	82	1.934
219	87	.214	86	.198	85	.194	84	.193	83	.194	82	.195
220	87	.113	86	.126	85	.113	84	.105	83	.097	82	.093
225	121	.105	149	.114	120	.120	119	.089	118	.097	117	.109
227	121	.436	149	.336	120	.269	119	.165	118	.138	117	.145
230	121	.470	149	.618	120	.793	119	.998	118	1.191	117	1.383
231	121	.867	149	.813	120	.751	119	.672	118	.599	117	.540
234	121	.818	149	.771	120	.713	119	.648	118	.582	117	.515
235	121	.320	149	.333	120	.368	119	.426	118	.453	117	.465
236	121	.419	149	.507	120	.603	119	.706	118	.793	117	.869
237	121	.458	149	.585	120	.749	119	.941	118	1.114	117	1.281
238	121	.436	149	.567	120	.737	119	.944	118	1.132	117	1.320
239	87	.365	86	.626	85	.770	84	.943	83	1.143	82	1.325
244	121	.071	149	.065	120	.076	119	.053	118	.060	117	.073
245	121	.079	149	.085	120	.090	119	.061	118	.069	117	.077
246	87	.232	86	.235	85	.231	84	.226	83	.219	82	.213
247	121	.230	149	.213	120	.224	119	.237	118	.238	117	.234
248	121	.147	149	.149	120	.160	119	.149	118	.153	117	.159
249	121	.134	149	.140	120	.150	119	.141	118	.147	117	.154

Table IX: Continuous Flow Hypersonic Tunnel - 2% Model
Nominal Conditions: β = 3.0°, M_∞ = 10.0, Upright, Pressures in psia

Orifice ID	Nominal α											
	-10.0°		-5.0°		0.0°		5.0°		10.0°		15.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
201	24	2.019	23	1.926	22	1.822	21	1.694	20	1.536	19	1.370
202	24	2.088	23	2.050	22	1.999	21	1.917	20	1.796	19	1.652
203	24	2.020	23	2.063	22	2.091	21	2.093	20	2.065	19	1.995
204	24	1.733	23	1.859	22	1.977	21	2.063	20	2.131	19	2.157
205	24	1.334	23	1.493	22	1.663	21	1.812	20	1.966	19	2.080
206	24	.979	23	1.143	22	1.334	21	1.514	20	1.713	19	1.883
207	24	.734	23	.891	22	1.079	21	1.268	20	1.484	19	1.679
208	24	.586	23	.725	22	.899	21	1.079	20	1.289	19	1.488
209	24	1.167	23	1.232	22	1.293	21	1.338	20	1.370	19	1.375
210	24	1.453	23	1.542	22	1.629	21	1.689	20	1.734	19	1.740
211	24	1.611	23	1.721	22	1.829	21	1.906	20	1.969	19	1.989
212	24	1.715	23	1.833	22	1.947	21	2.029	20	2.096	19	2.123
213	24	1.628	23	1.724	22	1.812	21	1.876	20	1.924	19	1.933
214	24	1.472	23	1.542	22	1.609	21	1.652	20	1.680	19	1.677
215	24	.935	23	.735	22	.537	21	.390	20	.283	19	.236
216	24	.413	23	.445	22	.482	21	.509	20	.531	19	.523
217	24	.575	23	.615	22	.662	21	.696	20	.720	19	.684
218	24	.260	23	.318	22	.409	21	.510	20	.651	19	.775
219	24	.145	23	.149	22	.156	21	.164	20	.174	19	.187
220	24	.217	23	.221	22	.228	21	.232	20	.235	19	.233
225	136	.663	135	.488	134	.338	133	.220	132	.150	131	.139
227	136	1.456	135	1.267	134	1.077	133	.891	132	.721	131	.556
230	136	.094	135	.110	134	.134	133	.180	132	.255	131	.324
231	136	.731	135	.751	134	.760	133	.777	132	.777	131	.734
234	136	.993	135	1.014	134	1.032	133	1.044	132	1.041	131	.999
235	136	.117	135	.134	134	.154	133	.164	132	.186	131	.197
236	136	.098	135	.114	134	.136	133	.165	132	.211	131	.245
237	136	.087	135	.104	134	.129	133	.161	132	.221	131	.272
238	136	.082	135	.097	134	.122	133	.152	132	.213	131	.263
239	24	.134	23	.149	22	.174	21	.201	20	.234	19	.252
244	136	.700	135	.506	134	.343	133	.188	132	.104	131	.086
245	136	.679	135	.498	134	.341	133	.219	132	.134	131	.114
246	24	.204	23	.199	22	.194	21	.191	20	.188	19	.188
247	136	.126	135	.137	134	.152	133	.148	132	.160	131	.170
248	136	.127	135	.130	134	.142	133	.115	132	.125	131	.143
249	136	.212	135	.201	134	.192	133	.187	132	.179	131	.178

Table IX(continued)

Nominal Conditions: $\beta =$ 3.0°, $M_\infty =$ 10.0, Upright, Pressures in psia

Orifice ID	Nominal α											
	20.0°		25.0°		30.0°		35.0°		40.0°		45.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
201	18	1.116	17	.944	16	.764	15	.599	14	.477	13	.426
202	18	1.399	17	1.224	16	1.022	15	.827	14	.671	13	.593
203	18	1.823	17	1.675	16	1.494	15	1.303	14	1.100	13	.913
204	18	2.092	17	2.025	16	1.912	15	1.769	14	1.593	13	1.396
205	18	2.115	17	2.132	16	2.108	15	2.043	14	1.926	13	1.755
206	18	2.000	17	2.083	16	2.124	15	2.130	14	2.089	13	1.985
207	18	1.835	17	1.966	16	2.061	15	2.123	14	2.139	13	2.088
208	18	1.664	17	1.822	16	1.955	15	2.061	14	2.125	13	2.117
209	18	1.308	17	1.255	16	1.177	15	1.082	14	.971	13	.852
210	18	1.664	17	1.603	16	1.506	15	1.385	14	1.247	13	1.106
211	18	1.916	17	1.854	16	1.747	15	1.613	14	1.454	13	1.285
212	18	2.059	17	1.994	16	1.882	15	1.740	14	1.568	13	1.377
213	18	1.865	17	1.787	16	1.671	15	1.537	14	1.372	13	1.187
214	18	1.605	17	1.530	16	1.423	15	1.300	14	1.157	13	1.007
215	18	.141	17	.135	16	.135	15	.143	14	.156	13	.184
216	18	.525	17	.517	16	.502	15	.484	14	.464	13	.443
217	18	.743	17	.730	16	.707	15	.675	14	.639	13	.599
218	18	.987	17	1.146	16	1.343	15	1.524	14	1.695	13	1.836
219	18	.153	17	.155	16	.158	15	.164	14	.171	13	.184
220	18	.242	17	.239	16	.234	15	.230	14	.229	13	.230
225	130	.099	129	.101	128	.123	127	.081	126	.089	125	.116
227	130	.431	129	.330	128	.259	127	.165	126	.141	125	.172
230	130	.481	129	.632	128	.807	127	1.011	126	1.203	125	1.381
231	130	.718	129	.680	128	.628	127	.575	126	.525	125	.477
234	130	.964	129	.907	128	.837	127	.759	126	.674	125	.588
235	130	.239	129	.269	128	.287	127	.348	126	.373	125	.368
236	130	.343	129	.419	128	.504	127	.606	126	.692	125	.765
237	130	.423	129	.548	128	.694	127	.889	126	1.059	125	1.218
238	130	.421	129	.555	128	.714	127	.921	126	1.109	125	1.288
239	18	.512	17	.619	16	.769	15	.947	14	1.123	13	1.281
244	130	.072	129	.072	128	.088	127	.049	126	.053	125	.080
245	130	.074	129	.072	128	.088	127	.055	126	.063	125	.089
246	18	.179	17	.179	16	.179	15	.179	14	.179	13	.183
247	130	.163	129	.167	128	.185	127	.186	126	.190	125	.189
248	130	.114	129	.123	128	.149	127	.120	126	.127	125	.143
249	130	.175	129	.176	128	.186	127	.173	126	.174	125	.177

Table X: Continuous Flow Hypersonic Tunnel - 2% Model
Nominal Conditions: β = -3.0°, M_∞ = 10.0, Upright, Pressures in psia

Orifice ID	Nominal α											
	-10.0°		-5.0°		0.0°		5.0°		10.0°		15.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
201	81	2.020	80	1.921	79	1.798	78	1.681	77	1.521	76	1.343
202	81	2.099	80	2.056	79	1.982	78	1.910	77	1.785	76	1.628
203	81	2.046	80	2.081	79	2.081	78	2.095	77	2.064	76	1.979
204	81	1.775	80	1.889	79	1.979	78	2.076	77	2.139	76	2.152
205	81	1.383	80	1.525	79	1.670	78	1.833	77	1.984	76	2.088
206	81	1.032	80	1.175	79	1.347	78	1.542	77	1.739	76	1.905
207	81	.777	80	.922	79	1.097	78	1.299	77	1.512	76	1.707
208	81	.633	80	.759	79	.924	78	1.117	77	1.326	76	1.526
209	81	1.364	80	1.432	79	1.480	78	1.537	77	1.569	76	1.564
210	81	1.613	80	1.694	79	1.762	78	1.839	77	1.886	76	1.888
211	81	1.727	80	1.827	79	1.910	78	2.003	77	2.065	76	2.078
212	81	1.685	80	1.785	79	1.869	78	1.962	77	2.024	76	2.037
213	81	1.496	80	1.579	79	1.638	78	1.705	77	1.744	76	1.741
214	81	1.314	80	1.371	79	1.409	78	1.456	77	1.478	76	1.465
215	81	.887	80	.740	79	.548	78	.379	77	.612	76	.212
216	81	.559	80	.595	79	.637	78	.680	77	.709	76	.720
217	81	.446	80	.465	79	.495	78	.526	77	.547	76	.552
218	81	.286	80	.331	79	.420	78	.540	77	.684	76	.827
219	81	.209	80	.212	79	.217	78	.222	77	.224	76	.224
220	81	.078	80	.078	79	.078	78	.080	77	.086	76	.101
225	164	.673	153	.494	165	.368	163	.209	162	.146	161	.137
227	164	1.464	153	1.269	165	1.094	163	.897	162	.713	161	.567
230	164	.097	153	.104	165	.104	163	.187	162	.254	161	.319
231	164	.952	153	.973	165	.998	163	1.004	162	.998	161	.969
234	164	.789	153	.802	165	.815	163	.818	162	.815	161	.797
235	164	.151	153	.165	165	.181	163	.246	162	.283	161	.296
236	164	.114	153	.130	165	.145	163	.227	162	.293	161	.350
237	164	.097	153	.102	165	.099	163	.191	162	.259	161	.314
238	164	.091	153	.094	165	.089	163	.170	162	.230	161	.288
239	81	.135	80	.146	79	.176	78	.217	77	.273	76	.326
244	164	.711	153	.496	165	.360	163	.200	162	.123	161	.109
245	164	.683	153	.498	165	.354	163	.206	162	.129	161	.111
246	81	.309	80	.303	79	.294	78	.288	77	.280	76	.269
247	164	.188	153	.192	165	.208	163	.239	162	.250	161	.248
248	164	.200	153	.184	165	.190	163	.169	162	.166	161	.171
249	164	.142	153	.140	165	.129	163	.118	162	.125	161	.140

Table X(continued)

Nominal Conditions: $\beta = -3.0^{\circ}$, $M_{\infty} =$ 10.0, Upright, Pressures in psia

Orifice ID	Nominal α											
	20.0°		25.0°		30.0°		35.0°		40.0°		45.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
201	75	1.155	74	.945	73	.774	72	.605	71	.470	70	.405
202	75	1.448	74	1.232	73	1.040	72	.838	71	.665	70	.572
203	75	1.857	74	1.684	73	1.504	72	1.295	71	1.087	70	.901
204	75	2.128	74	2.041	73	1.929	72	1.764	71	1.580	70	1.388
205	75	2.152	74	2.158	73	2.138	72	2.050	71	1.923	70	1.760
206	75	2.040	74	2.120	73	2.160	72	2.147	71	2.097	70	2.004
207	75	1.881	74	2.001	73	2.096	72	2.143	71	2.144	70	2.113
208	75	1.721	74	1.868	73	2.002	72	2.092	71	2.146	70	2.152
209	75	1.532	74	1.450	73	1.356	72	1.228	71	1.090	70	.951
210	75	1.851	74	1.762	73	1.656	72	1.508	71	1.343	70	1.184
211	75	2.049	74	1.963	73	1.854	72	1.694	71	1.514	70	1.334
212	75	2.009	74	1.928	73	1.822	72	1.667	71	1.494	70	1.317
213	75	1.702	74	1.607	73	1.504	72	1.364	71	1.214	70	1.054
214	75	1.421	74	1.345	73	1.255	72	1.137	71	1.011	70	.890
215	75	.194	74	.123	73	.120	72	.125	71	.140	70	.164
216	75	.709	74	.696	73	.672	72	.636	71	.596	70	.560
217	75	.503	74	.562	73	.550	72	.531	71	.508	70	.484
218	75	1.008	74	1.240	73	1.442	72	1.634	71	1.801	70	1.931
219	75	.219	74	.220	73	.215	72	.211	71	.211	70	.214
220	75	.111	74	.126	73	.113	72	.105	71	.098	70	.094
225	160	.096	159	.101	158	.116	157	.085	156	.094	155	.116
227	160	.437	159	.321	158	.264	157	.167	156	.143	155	.171
230	160	.471	159	.630	158	.799	157	1.001	156	1.204	155	1.396
231	160	.929	159	.862	158	.796	157	.710	156	.635	155	.572
234	160	.772	159	.726	158	.677	157	.616	156	.554	155	.494
235	160	.353	159	.387	158	.401	157	.455	156	.481	155	.477
236	160	.452	159	.552	158	.645	157	.745	156	.833	155	.908
237	160	.474	159	.627	158	.772	157	.965	156	1.145	155	1.312
238	160	.444	159	.598	158	.750	157	.954	156	1.150	155	1.338
239	75	.358	74	.619	73	.763	72	.946	71	1.141	70	1.329
244	160	.073	159	.073	158	.087	157	.060	156	.068	155	.088
245	160	.074	159	.075	158	.087	157	.059	156	.068	155	.087
246	75	.248	74	.257	73	.252	72	.243	71	.235	70	.231
247	160	.260	159	.254	158	.243	157	.257	156	.256	155	.244
248	160	.157	159	.161	158	.167	157	.158	156	.161	155	.168
249	160	.119	159	.129	158	.142	157	.129	156	.136	155	.149

Table XI: Continuous Flow Hypersonic Tunnel - 2% Model
Nominal Conditions: β = 5.0°, M_∞ = 10.0, Upright, Pressures in psia

Orifice ID	Nominal α											
	-10.0°		-5.0°		0.0°		5.0°		10.0°		15.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
201	57	1.995	56	1.906	55	1.792	54	1.650	53	1.493	52	1.314
202	57	2.068	56	2.038	55	1.979	54	1.879	53	1.753	52	1.594
203	57	2.001	56	2.055	55	2.081	54	2.068	53	2.020	52	1.937
204	57	1.723	56	1.861	55	1.975	54	2.053	53	2.097	52	2.108
205	57	1.328	56	1.502	55	1.664	54	1.815	53	1.939	52	2.040
206	57	.981	56	1.160	55	1.340	54	1.530	53	1.697	52	1.857
207	57	.741	56	.907	55	1.090	54	1.286	53	1.475	52	1.659
208	57	.598	56	.750	55	.917	54	1.107	53	1.295	52	1.486
209	57	1.096	56	1.166	55	1.223	54	1.260	53	1.279	52	1.277
210	57	1.394	56	1.493	55	1.569	54	1.623	53	1.649	52	1.649
211	57	1.570	56	1.692	55	1.789	54	1.862	53	1.901	52	1.911
212	57	1.737	56	1.869	55	1.977	54	2.052	53	2.093	52	2.105
213	57	1.657	56	1.764	55	1.852	54	1.905	53	1.932	52	1.926
214	57	1.543	56	1.625	55	1.688	54	1.724	53	1.734	52	1.713
215	57	.890	56	.683	55	.517	54	.350	53	.261	52	.213
216	57	.368	56	.401	55	.428	54	.456	53	.472	52	.481
217	57	.642	56	.691	55	.731	54	.771	53	.793	52	.801
218	57	.266	56	.331	55	.407	54	.532	53	.651	52	.804
219	57	.123	56	.126	55	.131	54	.139	53	.145	52	.156
220	57	.259	56	.265	55	.271	54	.277	53	.279	52	.276
225	148	.652	147	.481	146	.344	145	.201	144	.146	143	.130
227	148	1.451	147	1.265	146	1.073	145	.878	144	.709	143	.560
230	148	.095	147	.111	146	.133	145	.192	144	.247	143	.330
231	148	.675	147	.692	146	.704	145	.709	144	.705	143	.686
234	148	1.070	147	1.095	146	1.111	145	1.118	144	1.102	143	1.071
235	148	.112	147	.127	146	.147	145	.148	144	.161	143	.177
236	148	.095	147	.109	146	.128	145	.156	144	.185	143	.223
237	148	.090	147	.104	146	.127	145	.166	144	.204	143	.260
238	148	.085	147	.097	146	.120	145	.160	144	.201	143	.263
239	57	.135	56	.153	55	.178	54	.213	53	.269	52	.334
244	148	.691	147	.503	146	.346	145	.195	144	.126	143	.101
245	148	.684	147	.505	146	.350	145	.207	144	.136	143	.107
246	57	.171	56	.166	55	.163	54	.162	53	.163	52	.166
247	148	.117	147	.128	146	.146	145	.130	144	.137	143	.150
248	148	.115	147	.120	146	.135	145	.100	144	.106	143	.124
249	148	.248	147	.239	146	.233	145	.215	144	.207	143	.198

Table XI(continued)

Nominal Conditions: β = 5.0°, M_∞ = 10.0, Upright, Pressures in psia

Orifice ID	Nominal α											
	20.0°		25.0°		30.0°		35.0°		40.0°		45.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
201	51	1.134	50	.934	49	.748	48	.603	47	.477	46	.452
202	51	1.424	50	1.219	49	1.007	48	.836	47	.673	46	.626
203	51	1.813	50	1.653	49	1.475	48	1.289	47	1.089	46	.914
204	51	2.078	50	2.007	49	1.893	48	1.752	47	1.579	46	1.395
205	51	2.096	50	2.118	49	2.090	48	2.023	47	1.909	46	1.752
206	51	1.979	50	2.072	49	2.112	48	2.116	47	2.075	46	1.988
207	51	1.817	50	1.959	49	2.050	48	2.112	47	2.124	46	2.096
208	51	1.660	50	1.816	49	1.944	48	2.050	47	2.109	46	2.125
209	51	1.247	50	1.191	49	1.115	48	1.029	47	.928	46	.825
210	51	1.616	50	1.547	49	1.449	48	1.342	47	1.210	46	1.087
211	51	1.882	50	1.812	49	1.704	48	1.580	47	1.425	46	1.274
212	51	2.076	50	2.008	49	1.892	48	1.751	47	1.576	46	1.395
213	51	1.878	50	1.796	49	1.679	48	1.536	47	1.368	46	1.188
214	51	1.661	50	1.580	49	1.466	48	1.338	47	1.187	46	1.037
215	51	.208	50	.126	49	.126	48	.132	47	.147	46	.176
216	51	.475	50	.477	49	.466	48	.455	47	.441	46	.421
217	51	.778	50	.790	49	.755	48	.720	47	.675	46	.627
218	51	.958	50	1.173	49	1.367	48	1.554	47	1.723	46	1.852
219	51	.167	50	.138	49	.144	48	.149	47	.158	46	.169
220	51	.265	50	.277	49	.263	48	.248	47	.240	46	.233
225	142	.096	141	.102	140	.126	139	.085	138	.092	137	.109
227	142	.427	141	.325	140	.272	139	.162	138	.138	137	.149
230	142	.481	141	.634	140	.801	139	1.015	138	1.209	137	1.392
231	142	.661	141	.626	140	.573	139	.530	138	.485	137	.444
234	142	1.027	141	.964	140	.883	139	.804	138	.713	137	.617
235	142	.213	141	.236	140	.245	139	.323	138	.348	137	.359
236	142	.311	141	.386	140	.454	139	.569	138	.653	137	.732
237	142	.408	141	.534	140	.657	139	.869	138	1.038	137	1.201
238	142	.414	141	.550	140	.691	139	.914	138	1.101	137	1.286
239	51	.361	50	.613	49	.792	48	.954	47	1.156	46	1.305
244	142	.050	141	.055	140	.071	139	.058	138	.065	137	.081
245	142	.073	141	.076	140	.095	139	.057	138	.064	137	.079
246	51	.169	50	.163	49	.164	48	.165	47	.166	46	.169
247	142	.144	141	.152	140	.168	139	.168	138	.177	137	.180
248	142	.106	141	.120	140	.144	139	.115	138	.122	137	.134
249	142	.197	141	.196	140	.198	139	.193	138	.193	137	.193

Table XII: Continuous Flow Hypersonic Tunnel - 2% Model
Nominal Conditions: β = -5.0°, M_∞ = 10.0, Upright, Pressures in psia

Orifice ID	Nominal α											
	-10.0°		-5.0°		0.0°		5.0°		10.0°		15.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
201	69	2.013	68	1.916	67	1.805	66	1.699	65	1.542	64	1.349
202	69	2.091	68	2.051	67	1.991	66	1.931	65	1.811	64	1.635
203	69	2.030	68	2.074	67	2.089	66	2.118	65	2.094	64	1.989
204	69	1.750	68	1.882	67	1.986	66	2.098	65	2.171	64	2.163
205	69	1.354	68	1.524	67	1.681	66	1.856	65	2.016	64	2.102
206	69	.996	68	1.175	67	1.355	66	1.560	65	1.767	64	1.919
207	69	.753	68	.924	67	1.106	66	1.318	65	1.540	64	1.725
208	69	.606	68	.760	67	.931	66	1.133	65	1.349	64	1.544
209	69	1.418	68	1.497	67	1.556	66	1.627	65	1.670	64	1.649
210	69	1.636	68	1.740	67	1.821	66	1.913	65	1.971	64	1.952
211	69	1.728	68	1.851	67	1.949	66	2.057	65	2.129	64	2.119
212	69	1.633	68	1.752	67	1.849	66	1.953	65	2.024	64	2.015
213	69	1.430	68	1.519	67	1.588	66	1.665	65	1.712	64	1.688
214	69	1.235	68	1.300	67	1.348	66	1.401	65	1.428	64	1.401
215	69	.924	68	.727	67	.553	66	.389	65	.275	64	.217
216	69	.601	68	.656	67	.705	66	.755	65	.790	64	.794
217	69	.394	68	.422	67	.449	66	.477	65	.495	64	.489
218	69	.276	68	.345	67	.430	66	.551	65	.698	64	.842
219	69	.245	68	.252	67	.258	66	.263	65	.264	64	.259
220	69	.078	68	.078	67	.078	66	.079	65	.085	64	.100
225	176	.667	154	.499	175	.346	174	.219	173	.147	172	.137
227	176	1.444	154	1.269	175	1.079	174	.898	173	.717	172	.560
230	176	.090	154	.095	175	.126	174	.177	173	.252	172	.315
231	176	1.020	154	1.057	175	1.070	174	1.084	173	1.082	172	1.046
234	176	.716	154	.737	175	.738	174	.747	173	.746	172	.730
235	176	.177	154	.184	175	.226	174	.283	173	.326	172	.336
236	176	.126	154	.138	175	.182	174	.246	173	.326	172	.391
237	176	.090	154	.092	175	.130	174	.188	173	.270	172	.324
238	176	.082	154	.084	175	.117	174	.164	173	.235	172	.291
239	69	.134	68	.152	67	.179	66	.218	65	.274	64	.325
244	176	.699	154	.495	175	.347	174	.209	173	.123	172	.109
245	176	.676	154	.503	175	.342	174	.212	173	.129	172	.110
246	69	.357	68	.350	67	.344	66	.338	65	.327	64	.312
247	176	.224	154	.225	175	.250	174	.278	173	.292	172	.280
248	176	.235	154	.217	175	.215	174	.203	173	.192	172	.187
249	176	.116	154	.125	175	.125	174	.106	173	.118	172	.136

Table XII(continued)

Nominal Conditions: $\beta = -5.0^{\circ}$, $M_{\infty} =$ 10.0, Upright, Pressures in psia

Orifice ID	Nominal α											
	20.0°		25.0°		30.0°		35.0°		40.0°		45.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
201	63	1.147	62	.933	61	.768	60	.608	59	.474	58	.429
202	63	1.436	62	1.224	61	1.034	60	.843	59	.668	58	.597
203	63	1.843	62	1.682	61	1.500	60	1.292	59	1.084	58	.895
204	63	2.110	62	2.044	61	1.926	60	1.762	59	1.574	58	1.373
205	63	2.136	62	2.169	61	2.140	60	2.054	59	1.917	58	1.740
206	63	2.024	62	2.133	61	2.166	60	2.155	59	2.093	58	1.983
207	63	1.870	62	2.027	61	2.116	60	2.161	59	2.155	58	2.103
208	63	1.710	62	1.883	61	2.011	60	2.105	59	2.146	58	2.141
209	63	1.591	62	1.520	61	1.412	60	1.277	59	1.129	58	.975
210	63	1.889	62	1.815	61	1.700	60	1.547	59	1.374	58	1.204
211	63	2.063	62	1.997	61	1.880	60	1.718	59	1.532	58	1.343
212	63	1.962	62	1.901	61	1.793	60	1.644	59	1.470	58	1.288
213	63	1.624	62	1.570	61	1.469	60	1.337	59	1.187	58	1.024
214	63	1.342	62	1.281	61	1.198	60	1.089	59	.968	58	.848
215	63	.203	62	.121	61	.118	60	.121	59	.133	58	.168
216	63	.773	62	.763	61	.732	60	.690	59	.643	58	.594
217	63	.441	62	.512	61	.505	60	.492	59	.474	58	.437
218	63	1.010	62	1.264	61	1.459	60	1.655	59	1.816	58	1.943
219	63	.247	62	.254	61	.246	60	.236	59	.229	58	.224
220	63	.107	62	.148	61	.150	60	.154	59	.161	58	.171
225	171	.097	170	.099	169	.112	168	.079	167	.087	166	.104
227	171	.435	170	.322	169	.255	168	.162	167	.133	166	.140
230	171	.471	170	.630	169	.810	168	1.020	167	1.228	166	1.421
231	171	1.002	170	.935	169	.852	168	.762	167	.673	166	.590
234	171	.707	170	.669	169	.623	168	.577	167	.520	166	.458
235	171	.404	170	.439	169	.465	168	.507	167	.530	166	.537
236	171	.501	170	.605	169	.705	168	.807	167	.896	166	.966
237	171	.495	170	.649	169	.811	168	1.009	167	1.192	166	1.363
238	171	.455	170	.608	169	.775	168	.984	167	1.185	166	1.378
239	63	.352	62	.634	61	.773	60	.950	59	1.153	58	1.335
244	171	.072	170	.073	169	.081	168	.055	167	.061	166	.075
245	171	.073	170	.073	169	.081	168	.054	167	.061	166	.078
246	63	.284	62	.296	61	.287	60	.277	59	.261	58	.251
247	171	.307	170	.299	169	.289	168	.291	167	.288	166	.278
248	171	.184	170	.184	169	.187	168	.177	167	.178	166	.181
249	171	.110	170	.119	169	.132	168	.119	167	.128	166	.141

Table XIII: Data Summary - Continuous Flow Hypersonic Tunnel - 4% Model

Ref	Run	Conf	M_∞	α deg	β deg	ϕ deg	P_{t_1} psia	q_∞ psia	P_∞ psia	P_{t_2} psia
1	1	2	10.02	5.6	0.0	180	716.96	1.158	.016	2.131
2	1	2	10.02	2.9	0.0	180	720.93	1.162	.016	2.140
3	1	2	10.02	.5	.0	180	724.13	1.164	.017	2.146
4	1	2	10.02	-2.1	0.0	180	723.13	1.161	.016	2.140
5	1	2	10.02	-4.6	0.0	180	726.55	1.165	.017	2.149
6	2	2	10.02	-5.5	0.0	0	723.13	1.162	.016	2.142
7	2	2	10.02	-3.1	0.0	0	721.92	1.157	.016	2.134
8	2	2	10.02	-.5	-.0	0	727.44	1.164	.017	2.148
9	2	2	10.02	1.9	0.0	0	725.56	1.160	.016	2.142
10	3	2	10.02	-.5	0.0	0	716.74	1.154	.016	2.125
11	3	2	10.02	1.9	-.0	0	722.69	1.158	.016	2.137
12	3	2	10.02	4.5	0.0	0	727.44	1.163	.017	2.148
13	3	2	10.02	9.5	0.0	0	727.66	1.162	.017	2.147
14	3	2	10.02	14.5	0.0	0	725.45	1.159	.016	2.141
15	5	2	10.02	45.3	.0	0	725.69	1.165	.017	2.149
16	5	2	10.02	40.0	0.0	0	723.35	1.155	.016	2.133
17	5	2	10.02	34.8	.0	0	721.92	1.150	.016	2.[illegible]6
18	11	2	10.02	24.7	-3.0	0	728.10	1.173	.017	2.160
19	11	2	10.02	24.7	-1.5	0	723.35	1.157	.016	2.136
20	11	2	10.02	24.7	3.0	0	723.13	1.153	.016	2.132
21	12	2	10.02	-5.3	3.0	0	724.46	1.167	.017	2.149
22	12	2	10.02	-.4	3.0	0	719.83	1.154	.016	2.129
23	12	2	10.02	4.6	3.0	0	723.24	1.156	.016	2.135
24	12	2	10.02	9.6	3.0	0	724.35	1.157	.016	2.137
25	12	2	10.02	14.6	3.0	0	722.03	1.152	.016	2.129
26	12	2	10.02	19.6	3.0	0	721.37	1.152	.016	2.128
27	13	2	10.02	-5.5	-3.0	0	722.36	1.160	.016	2.139
28	13	2	10.02	-.6	-3.0	0	722.91	1.158	.016	2.136
29	13	2	10.02	4.5	-3.0	0	724.13	1.157	.016	2.137
30	13	2	10.02	9.6	-3.0	0	724.35	1.156	.016	2.136
31	13	2	10.02	14.6	-3.0	0	728.43	1.163	.017	2.148
32	13	2	10.02	19.6	-3.0	0	725.12	1.158	.016	2.139
33	14	2	10.02	45.2	-3.0	0	722.47	1.160	.016	2.138
34	14	2	10.02	40.1	-3.0	0	727.10	1.163	.017	2.147
35	14	2	10.02	34.7	-3.0	0	728.43	1.162	.017	2.147
36	14	2	10.02	29.8	-3.0	0	727.55	1.159	.017	2.143
37	14	2	10.02	24.8	-3.0	0	725.12	1.155	.016	2.136
38	16	1	10.02	-5.6	0.0	0	723.91	1.157	.016	2.137
39	16	1	10.02	-.5	0.0	0	728.10	1.160	.017	2.145
40	16	1	10.02	4.4	0.0	0	724.35	1.153	.016	2.132
41	16	1	10.02	9.5	0.0	0	724.46	1.154	.016	2.134
42	16	1	10.02	14.5	0.0	0	727.66	1.162	.017	2.147
43	16	1	10.02	19.5	0.0	0	727.55	1.164	.017	2.149
44	17	1	10.02	45.1	.0	0	722.47	1.157	.016	2.135
45	17	1	10.02	40.2	.0	0	722.58	1.156	.016	2.134
46	17	1	10.02	34.9	.0	0	724.35	1.158	.016	2.138
47	17	1	10.02	29.8	.0	0	722.47	1.154	.016	2.131
48	17	1	10.02	24.9	.0	0	724.79	1.156	.016	2.137
49	18	1	10.02	-5.7	1.5	0	716.52	1.147	.016	2.117
50	18	1	10.02	-.5	1.5	0	718.94	1.148	.016	2.121
51	18	1	10.02	4.7	1.5	0	724.57	1.155	.016	2.135
52	18	1	10.02	9.7	1.5	0	723.69	1.154	.016	2.132
53	18	1	10.02	14.6	1.5	0	724.46	1.155	.016	2.135
54	18	1	10.02	19.5	1.5	0	726.22	1.159	.016	2.142
55	19	1	10.02	34.6	1.5	0	716.08	1.147	.016	2.117
56	19	1	10.02	29.6	1.5	0	720.05	1.148	.016	2.122
57	19	1	10.02	24.7	1.5	0	724.57	1.154	.016	2.134
58	19	1	10.02	24.7	-.0	0	722.25	1.151	.016	2.128
59	20	1	10.02	-5.7	-1.5	0	720.27	1.152	.016	2.127
60	20	1	10.02	-.5	-1.5	0	720.49	1.149	.016	2.124
61	20	1	10.02	4.4	-1.5	0	722.47	1.152	.016	2.129
62	20	1	10.02	9.6	-1.5	0	724.46	1.155	.016	2.135

Table XIII(continued)

Ref	Run	Conf	M_∞	α deg	β deg	ϕ deg	P_{t_1} psia	q_∞ psia	P_∞ psia	P_{t_2} psia
63	20	1	10.02	14.6	−1.5	0	726.00	1.158	.016	2.140
64	20	1	10.02	19.6	−1.5	0	724.13	1.155	.016	2.135
65	21	1	10.02	45.2	−1.5	0	724.57	1.161	.016	2.143
66	21	1	10.02	40.2	−1.5	0	723.24	1.155	.016	2.134
67	21	1	10.02	34.8	−1.5	0	725.56	1.158	.016	2.139
68	21	1	10.02	29.8	−1.5	0	721.15	1.150	.016	2.125
69	21	1	10.02	24.7	−1.5	0	725.67	1.157	.016	2.138
70	22	1	10.02	−5.7	3.0	0	731.52	1.173	.017	2.164
71	22	1	10.02	−.5	3.0	0	724.24	1.157	.016	2.136
72	22	1	10.02	4.6	3.0	0	721.70	1.152	.016	2.128
73	22	1	10.02	9.5	3.0	0	725.89	1.157	.016	2.138
74	22	1	10.02	14.5	3.0	0	722.69	1.151	.016	2.128
75	22	1	10.02	19.7	3.0	0	724.35	1.153	.016	2.133
76	22	1	10.02	24.7	3.0	0	728.76	1.161	.017	2.147
77	23	1	10.02	−5.6	−3.0	0	724.02	1.165	.017	2.146
78	23	1	10.02	−.6	−3.0	0	720.93	1.155	.016	2.131
79	23	1	10.02	4.5	−3.0	0	722.03	1.153	.016	2.130
80	23	1	10.02	9.5	−3.0	0	724.35	1.154	.016	2.133
81	23	1	10.02	14.6	−3.0	0	723.24	1.151	.016	2.129
82	23	1	10.02	19.7	−3.0	0	724.02	1.152	.016	2.131
83	23	1	10.02	24.7	−3.0	0	724.35	1.154	.016	2.134
84	26	1	10.02	45.2	−3.0	0	720.82	1.154	.016	2.130
85	26	1	10.02	40.0	−3.0	0	721.92	1.154	.016	2.130
86	26	1	10.02	34.8	−3.0	0	724.68	1.158	.016	2.139
87	26	1	10.02	29.8	−3.0	0	724.68	1.158	.016	2.139
88	27	2	10.02	29.8	.0	0	719.72	1.151	.016	2.125
89	27	2	10.02	24.7	0.0	0	724.68	1.155	.016	2.135
90	27	2	10.02	19.7	0.0	0	723.13	1.151	.016	2.129
91	27	2	10.02	14.6	.0	0	723.02	1.152	.016	2.130
92	28	2	10.02	−5.6	1.5	0	726.66	1.191	.017	2.181
93	28	2	10.02	−.4	1.5	0	725.34	1.175	.017	2.160
94	28	2	10.02	4.6	1.5	0	723.24	1.164	.017	2.144
95	28	2	10.02	9.5	1.5	0	727.66	1.166	.017	2.151
96	28	2	10.02	14.7	1.5	0	722.36	1.153	.016	2.130
97	28	2	10.02	19.6	1.5	0	722.69	1.152	.016	2.129
98	29	2	10.02	34.7	1.5	0	715.86	1.160	.016	2.132
99	29	2	10.02	29.8	1.5	0	721.04	1.160	.016	2.138
100	29	2	10.02	24.8	1.5	0	725.56	1.162	.017	2.144
101	29	2	10.02	−.5	1.5	0	724.24	1.156	.016	2.135
102	29	2	10.02	−5.5	1.5	0	725.89	1.159	.016	2.141
103	30	2	10.02	−5.6	−1.5	0	718.83	1.159	.016	2.134
104	30	2	10.02	−.5	−1.5	0	720.38	1.152	.016	2.127
105	30	2	10.02	4.4	−1.5	0	721.70	1.150	.016	2.126
106	30	2	10.02	9.6	−1.5	0	725.01	1.155	.016	2.135
107	30	2	10.02	14.6	−1.5	0	724.24	1.155	.016	2.135
108	30	2	10.02	19.6	−1.5	0	729.20	1.166	.017	2.153
109	31	2	10.02	45.5	−1.5	0	732.29	1.176	.017	2.169
110	31	2	10.02	40.2	−1.5	0	723.02	1.154	.016	2.133
111	31	2	10.02	34.9	−1.5	0	725.56	1.156	.016	2.137
112	31	2	10.02	29.8	−1.5	0	724.02	1.154	.016	2.133
113	32	3	10.02	−5.6	.0	0	726.66	1.165	.017	2.149
114	32	3	10.02	−.5	.0	0	723.47	1.152	.016	2.131
115	32	3	10.02	4.5	.0	0	725.12	1.154	.016	2.135
116	32	3	10.02	9.7	.0	0	727.55	1.160	.017	2.144
117	32	3	10.02	14.5	0.0	0	723.91	1.156	.016	2.136
118	32	3	10.02	19.6	.0	0	725.45	1.159	.016	2.141
119	33	3	10.02	45.3	.0	0	720.60	1.153	.016	2.128
120	33	3	10.02	40.0	.0	0	726.99	1.157	.016	2.139
121	33	3	10.02	34.9	.0	0	725.78	1.154	.016	2.135
122	33	3	10.02	29.8	0.0	0	730.96	1.165	.017	2.154
123	33	3	10.02	24.8	.0	0	725.78	1.157	.016	2.138
124	34	3	10.02	−5.6	1.5	0	716.96	1.145	.016	2.116

Table XIII(continued)

Ref	Run	Conf	M_∞	α deg	β deg	ϕ deg	P_{t_1} psia	q_∞ psia	P_∞ psia	P_{t_2} psia
125	34	3	10.02	-.4	1.5	0	722.03	1.151	.016	2.128
126	34	3	10.02	4.6	1.5	0	731.18	1.165	.017	2.154
127	34	3	10.02	9.6	1.5	0	726.00	1.158	.016	2.140
128	34	3	10.02	14.6	1.5	0	726.11	1.158	.016	2.141
129	34	3	10.02	19.7	1.5	0	725.01	1.157	.016	2.138
130	35	3	10.02	34.6	1.5	0	719.50	1.147	.016	2.121
131	35	3	10.02	29.9	1.5	0	722.14	1.149	.016	2.126
132	35	3	10.02	24.7	1.5	0	725.67	1.154	.016	2.135
133	35	3	10.02	24.6	3.0	0	726.44	1.157	.016	2.140
134	36	3	10.02	-5.6	-1.5	0	715.30	1.141	.016	2.109
135	36	3	10.02	-.6	-1.5	0	722.80	1.151	.016	2.129
136	36	3	10.02	4.6	-1.5	0	724.90	1.154	.016	2.134
137	36	3	10.02	9.5	-1.5	0	723.69	1.153	.016	2.132
138	36	3	10.02	14.6	-1.5	0	725.01	1.156	.016	2.137
139	36	3	10.02	19.6	-1.5	0	725.89	1.158	.016	2.140
140	37	3	10.02	45.4	-1.5	0	726.22	1.155	.016	2.136
141	37	3	10.02	40.0	-1.5	0	734.82	1.170	.017	2.164
142	37	3	10.02	34.8	-1.5	0	730.19	1.164	.017	2.151
143	37	3	10.02	29.7	-1.5	0	731.18	1.166	.017	2.155
144	38	3	10.02	-5.6	3.0	0	731.41	1.163	.017	2.151
145	38	3	10.02	-.5	3.0	0	728.98	1.161	.017	2.147
146	38	3	10.02	4.4	3.0	0	730.63	1.164	.017	2.153
147	38	3	10.02	9.5	3.0	0	729.64	1.163	.017	2.150
148	38	3	10.02	14.5	3.0	0	734.27	1.171	.017	2.164
149	38	3	10.02	19.6	3.0	0	728.87	1.163	.017	2.149
150	38	3	10.02	24.5	-1.5	0	732.18	1.167	.017	2.158
151	39	3	10.02	-5.6	-3.0	0	727.88	1.164	.017	2.149
152	39	3	10.02	-.6	-3.0	0	724.46	1.156	.016	2.136
153	39	3	10.02	4.6	-3.0	0	728.54	1.160	.017	2.145
154	39	3	10.02	9.6	-3.0	0	730.96	1.164	.017	2.152
155	39	3	10.02	14.5	-3.0	0	730.30	1.163	.017	2.151
156	39	3	10.02	19.6	-3.0	0	728.98	1.162	.017	2.148
157	40	3	10.02	45.4	-3.0	0	725.12	1.160	.016	2.141
158	40	3	10.02	40.0	-3.0	0	728.65	1.159	.017	2.144
159	40	3	10.02	34.6	-3.0	0	733.28	1.166	.017	2.158
160	40	3	10.02	29.8	-3.0	0	732.73	1.166	.017	2.157
161	40	3	10.02	24.8	-3.0	0	726.66	1.158	.016	2.141
162	41	3	10.02	45.1	-3.0	0	726.88	1.157	.016	2.140
163	41	3	10.02	40.1	-3.0	0	731.63	1.162	.017	2.151
164	41	3	10.02	34.7	-3.0	0	728.43	1.157	.016	2.142
165	41	3	10.02	29.8	-3.0	0	732.07	1.164	.017	2.153
166	41	3	10.02	24.8	-3.0	0	732.40	1.166	.017	2.156
167	42	4	10.02	-5.6	-.0	0	732.51	1.169	.017	2.160
168	42	4	10.02	-.5	0.0	0	726.66	1.155	.016	2.137
169	42	4	10.02	4.6	.0	0	735.93	1.171	.017	2.166
170	42	4	10.02	9.7	-.0	0	734.27	1.168	.017	2.160
171	42	4	10.02	14.6	.0	0	731.29	1.163	.017	2.152
172	42	4	10.02	19.7	-.0	0	729.97	1.163	.017	2.151
173	43	4	10.02	45.4	.0	0	730.63	1.165	.017	2.153
174	43	4	10.02	40.1	.0	0	725.12	1.152	.016	2.132
175	43	4	10.02	34.9	0.0	0	735.38	1.167	.017	2.161
176	43	4	10.02	29.9	-.0	0	727.66	1.155	.016	2.138
177	43	4	10.02	24.8	.0	0	733.94	1.169	.017	2.161
178	44	4	10.02	-5.6	1.5	0	726.33	1.157	.016	2.139
179	44	4	10.02	-.6	1.5	0	728.87	1.160	.017	2.145
180	44	4	10.02	4.5	1.5	0	726.88	1.157	.016	2.140
181	44	4	10.02	9.6	1.5	0	729.42	1.164	.017	2.151
182	44	4	10.02	14.5	1.5	0	732.07	1.170	.017	2.161
183	45	4	10.02	34.5	1.5	0	730.19	1.164	.017	2.152
184	45	4	10.02	29.6	1.5	0	726.77	1.157	.016	2.139
185	45	4	10.02	24.6	1.5	0	728.10	1.158	.016	2.143
186	45	4	10.02	19.6	1.5	0	730.85	1.163	.017	2.152

Table XIII(continued)

Ref	Run	Conf	M_∞	α deg	β deg	ϕ deg	P_{t_1} psia	q_∞ psia	P_∞ psia	P_{t_2} psia
187	46	4	10.02	-5.6	-1.5	0	727.88	1.161	.017	2.146
188	46	4	10.02	-.7	-1.5	0	727.21	1.160	.017	2.143
189	46	4	10.02	4.6	-1.5	0	728.32	1.162	.017	2.147
190	46	4	10.02	9.5	-1.5	0	726.55	1.159	.016	2.142
191	46	4	10.02	14.7	-1.5	0	726.77	1.159	.016	2.142
192	46	4	10.02	19.6	-1.5	0	726.66	1.159	.016	2.142
193	47	4	10.02	45.5	-1.5	0	730.41	1.162	.017	2.150
194	47	4	10.02	40.1	-1.5	0	728.32	1.159	.017	2.144
195	47	4	10.02	34.9	-1.5	0	729.42	1.163	.017	2.150
196	47	4	10.02	29.8	-1.5	0	730.85	1.166	.017	2.155
197	47	4	10.02	24.8	-1.5	0	731.41	1.168	.017	2.158
198	48	4	10.02	-5.6	3.0	0	721.37	1.151	.016	2.127
199	48	4	10.02	-.4	3.0	0	718.06	1.141	.016	2.112
200	48	4	10.02	4.5	3.0	0	720.93	1.145	.016	2.120
201	48	4	10.02	9.5	3.0	0	719.61	1.144	.016	2.117
202	48	4	10.02	14.6	3.0	0	723.02	1.152	.016	2.130
203	48	4	10.02	19.5	3.0	0	720.93	1.150	.016	2.125
204	49	4	10.02	24.6	3.0	0	770.33	1.229	.017	2.271
205	49	4	10.02	24.7	-3.0	0	751.59	1.198	.017	2.215
206	49	4	10.02	19.6	-3.0	0	746.73	1.190	.017	2.200
207	50	4	10.02	-5.6	-3.0	0	752.14	1.204	.017	2.222
208	50	4	10.02	-.6	-3.0	0	740.45	1.179	.017	2.181
209	50	4	10.02	4.5	-3.0	0	739.46	1.177	.017	2.177
210	50	4	10.02	9.6	-3.0	0	739.01	1.178	.017	2.178
211	50	4	10.02	14.6	-3.0	0	739.68	1.182	.017	2.183
212	51	4	10.02	45.2	-3.0	0	715.75	1.144	.016	2.112
213	51	4	10.02	40.1	-3.0	0	715.97	1.138	.016	2.106
214	51	4	10.02	34.8	-3.0	0	721.59	1.147	.016	2.122
215	51	4	10.02	29.8	-3.0	0	726.22	1.157	.016	2.139

Table XIV: Continuous Flow Hypersonic Tunnel - 4% Model
Nominal Conditions: β = 0.0°, M_∞ = 10.0, Inverted, Pressures in psia

Orifice ID	Nominal α									
	-5.0°		-2.5°		0.0°		2.5°		5.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
2	5	.246	4	.284	3	.337	2	.387	1	.453
9	5	.689	4	.600	3	.513	2	.446	1	.372
17	5	.642	4	.543	3	.455	2	.381	1	.307
21	5	.186	4	.186	3	.186	2	.184	1	.174
22	5	.178	4	.178	3	.177	2	.176	1	.167
91	5	.084	4	.093	3	.106	2	.117	1	.131
921	5	.794	4	.702	3	.612	2	.540	1	.459
922	5	.283	4	.329	3	.390	2	.445	1	.519
93	5	.156	4	.183	3	.221	2	.253	1	.297
201	5	1.864	4	1.776	3	1.693	2	1.609	1	1.514
203	5	2.144	4	2.123	3	2.116	2	2.102	1	2.083
208	5	.735	4	.809	3	.896	2	.967	1	1.047
209	5	1.516	4	1.525	3	1.538	2	1.543	1	1.548
214	5	1.476	4	1.481	3	1.490	2	1.491	1	1.492
225	5	.470	4	.391	3	.317	2	.264	1	.211
226	5	1.076	4	.980	3	1.048	2	.799	1	.710
227	5	1.227	4	1.133	3	1.044	2	.961	1	.870
228	5	1.640	4	1.547	3	1.457	2	1.368	1	1.264
229	5	.458	4	.522	3	.599	2	.670	1	.753
230	5	.106	4	.120	3	.140	2	.154	1	.165
244	5	.449	4	.371	3	.289	2	.243	1	.192
245	5	.439	4	.367	3	.328	2	.323	1	.333

Table XV: Continuous Flow Hypersonic Tunnel - 4% Model

Nominal Conditions: $\beta =$ 0.0°, $M_\infty =$ 10.0, Upright, Pressures in psia

Orifice ID	Nominal α: -5.0°		-2.5°		0.0°		2.5°		5.0°		10.0°		15.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
2	6	.228	7	.262	8	.309	9	.360	12	.426	13	.560	14	.717
5	167	.463			168	.465			169	.475	170	.477	171	.471
6	167	.487			168	.483			169	.488	170	.482	171	.470
9	6	.728	7	.639	8	.554	9	.476	12	.406	13	.289	14	.203
13	113	.342			114	.343			115	.344	116	.344	117	.342
14	113	.361			114	.360			115	.358	116	.354	117	.348
17	6	.664	7	.564	8	.474	9	.393	12	.324	13	.223	14	.158
19	113	.237			114	.230			115	.228	116	.228	117	.229
20	113	.254			114	.240			115	.236	116	.233	117	.232
21	6	.178	7	.178	8	.179	9	.179	12	.178	13	.178	14	.178
22	6	.190	7	.190	8	.190	9	.191	12	.188	13	.189	14	.189
23	113	.140			114	.135			115	.134	116	.133	117	.135
24	113	.158			114	.149			115	.147	116	.145	117	.145
25	113	.124			114	.121			115	.118	116	.115	117	.114
26	113	.135			114	.133			115	.129	116	.124	117	.122
44	167	.338			168	.365			169	.405	170	.436	171	.461
87	167	.299			168	.375			169	.497	170	.622	171	.751
88	167	.309			168	.384			169	.502	170	.623	171	.748
89	167	.088			168	.084			169	.098	170	.148	171	.243
90	167	.074			168	.078			169	.106	170	.172	171	.273
91	38	.096			39	.090			40	.109	41	.173	42	.276
921	6	.836	7	.746	8	.657	9	.575	12	.499	13	.367	14	.270
922	6	.265	7	.298	8	.355	9	.413	12	.485	13	.632	14	.800
93	6	.144	7	.161	8	.197	9	.234	12	.279	13	.388	14	.524
201	38	1.875			39	1.747			40	1.589	41	1.399	42	1.205
202	38	2.082			39	2.027			40	1.947	41	1.832	42	1.684
203	38	2.102			39	2.119			40	2.116	41	2.098	42	2.022
204	38	1.953			39	2.044			40	2.102	41	2.166	42	2.179
205	38	1.519			39	1.701			40	1.851	41	2.014	42	2.140
206	38	1.227			39	1.426			40	1.595	41	1.778	42	1.958
207	38	.991			39	1.181			40	1.347	41	1.529	42	1.729
208	38	.687			39	.848			40	1.001	41	1.181	42	1.401
209	38	1.445			39	1.499			40	1.528	41	1.550	42	1.535
210	38	1.617			39	1.694			40	1.743	41	1.790	42	1.795
211	38	1.823			39	1.919			40	1.981	41	2.051	42	2.066
212	38	1.854			39	1.942			40	2.000	41	2.067	42	2.078

Table XV(continued)

Nominal Conditions: β = 0.0°, M_∞ = 10.0, Upright, Pressures in psia

Orifice ID	Nominal α													
	-5.0°		-2.5°		0.0°		2.5°		5.0°		10.0°		15.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
213	38	1.670			39	1.737			40	1.777	41	1.821	42	1.817
214	38	1.490			39	1.537			40	1.556	41	1.575	42	1.554
215	38	.822			39	.644			40	.486	41	.355	42	.257
216	38	.507			39	.547			40	.574	41	.599	42	.614
217	38	.538			39	.577			40	.602	41	.623	42	.637
218	38	.275			39	.376			40	.500	41	.651	42	.826
219	38	.148			39	.157			40	.159	41	.163	42	.167
220	38	.173			39	.182			40	.183	41	.187	42	.191
225	6	.492	7	.417	8	.346	9	.285	12	.230	13	.156	14	.109
226	6	1.136	7	1.044	8	.952	9	.855	12	.766	13	.605	14	.467
227	6	1.265	7	1.185	8	1.105	9	1.014	12	.924	13	.756	14	.600
228	6	1.663	7	1.587	8	1.517	9	1.431	12	1.335	13	1.128	14	.927
229	6	.429	7	.488	8	.559	9	.630	12	.716	13	.887	14	1.073
230	6	.096	7	.097	8	.107	9	.125	12	.161	13	.247	14	.363
231	113	.847			114	.854			115	.859	116	.852	117	.826
232	113	1.246			114	1.271			115	1.294	116	1.298	117	1.263
233	113	1.296			114	1.304			115	1.311	116	1.309	117	1.263
234	113	.898			114	.893			115	.889	116	.879	117	.849
235	167	.135			168	.153			169	.193	170	.236	171	.278
236	167	.099			168	.118			169	.177	170	.255	171	.337
237	167	.088			168	.090			169	.123	170	.198	171	.314
238	167	.087			168	.090			169	.126	170	.203	171	.320
239	167	.088			168	.091			169	.120	170	.192	171	.304
244	38	.473			39	.330			40	.229	41	.162	42	.123
245	6	.463	7	.392	8	.328	9	.268	12	.218	13	.145	14	.101
246	167	.272			168	.264			169	.260	170	.256	171	.252
247	167	.168			168	.174			169	.186	170	.198	171	.206
248	113	.134			114	.127			115	.121	116	.113	117	.107
249	113	.153			114	.143			115	.136	116	.127	117	.119

Table XV: Continuous Flow Hypersonic Tunnel - 4% Model(continued)
Nominal Conditions: $\beta =$ 0.0°, $M_\infty =$ 10.0, Upright, Pressures in psia

Orifice ID	Nominal α											
	20.0°		25.0°		30.0°		35.0°		40.0°		45.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
2	90	.894	89	1.100	88	1.308						
5	172	.458	177	.441	176	.410	175	.378	174	.355	173	.353
6	172	.450	177	.422	176	.389	175	.359	174	.337	173	.335
9	90	.121	89	.087	88	.076	17	.068	16	.070	15	.082
13	118	.337	123	.319	122	.303	121	.288	120	.295	119	.296
14	118	.338	123	.315	122	.297	121	.281	120	.290	119	.293
17	90	.088	89	.067	88	.064	17	.076	16	.078	15	.086
19	118	.230	123	.231	122	.227						
20	118	.230	123	.220	122	.212						
21	90	.183	89	.185	88	.170						
22	90	.183	89	.180	88	.161						
23	118	.138	123	.154	122	.162						
24	118	.147	123	.151	122	.156						
25	118	.115	123	.144	122	.155						
26	118	.123	123	.145	122	.154						
44	172	.479	177	.494	176	.503						
87	172	.891	177	1.050	176	1.179	175	1.296	174	1.451	173	1.538
88	172	.880	177	1.027	176	1.151	175	1.264	174	1.403	173	1.475
89	172	.386	177	.612	176	.884						
90	172	.412	177	.591	176	.795						
91	43	.405	48	.626	47	.753						
921	90	.168	89	.129	88	.108	17	.115	16	.112	15	.116
922	90	.987	89	1.209	88	1.422						
93	90	.687	89	.861	88	1.054						
201	43	1.007	48	.819	47	.637	46	.505	45	.383	44	.292
202	43	1.515	48	1.292	47	1.100	46	.924	45	.752	44	.586
203	43	1.901	48	1.665	47	1.501	46	1.306	45	1.102	44	.887
204	43	2.137	48	1.956	47	1.853	46	1.667	45	1.457	44	1.197
205	43	2.192	48	2.078	47	2.127	46	2.009	45	1.857	44	1.643
206	43	2.079	48	2.054	47	2.184	46	2.151	45	2.074	44	1.942
207	43	1.896	48	1.927	47	2.135	46	2.169	45	2.140	44	2.069
208	43	1.622	48	1.736	47	1.986	46	2.097	45	2.132	44	2.128
209	43	1.481	48	1.373	47	1.262	46	1.124	45	.967	44	.823
210	43	1.750	48	1.609	47	1.522	46	1.363	45	1.181	44	.979
211	43	2.024	48	1.862	47	1.757	46	1.573	45	1.366	44	1.122
212	43	2.035	48	1.862	47	1.774	46	1.604	45	1.416	44	1.180

Table XV(continued)

Nominal Conditions: $\beta =$ 0.0°, $M_\infty =$ 10.0, Upright, Pressures in psia

Orifice ID	Nominal α											
	20.0°		25.0°		30.0°		35.0°		40.0°		45.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
213	43	1.761	48	1.627	47	1.515	46	1.367	45	1.201	44	1.003
214	43	1.489	48	1.375	47	1.263	46	1.137	45	.997	44	.845
215	43	.198	48	.149	47	.108	46	.098	45	.093	44	.095
216	43	.614	48	.638	47	.583	46	.559	45	.531	44	.523
217	43	.632	48	.639	47	.578	46	.552	45	.527	44	.515
218	43	1.009	48	1.253	47	1.451						
219	43	.169	48	.228	47	.159						
220	43	.192	48	.220	47	.174						
225	90	.065	89	.056	88	.057						
226	90	.325	89	.244	88	.170	17	.134	16	.124	15	.123
227	90	.446	89	.338	88	.238	17	.174	16	.148	15	.136
228	90	.728	89	.563	88	.431	17	.326	16	.251	15	.192
229	90	1.301	89	1.519	88	1.703	17	1.883	16	2.024	15	2.159
230	90	.516	89	.677	88	.860						
231	118	.794	123	.744	122	.683	121	.603	120	.536	119	.491
232	118	1.210	123	1.134	122	1.035	121	.905	120	.792	119	.684
233	118	1.193	123	1.102	122	1.003	121	.895	120	.789	119	.668
234	118	.804	123	.745	122	.683	121	.611	120	.546	119	.491
235	172	.326	177	.386	176	.437						
236	172	.442	177	.567	176	.686						
237	172	.465	177	.663	176	.875						
238	172	.470	177	.657	176	.852						
239	172	.453	177	.653	176	.874						
244	43	.103	48	.099	47	.089						
245	90	.063	89	.054	88	.058						
246	172	.250	177	.252	176	.248						
247	172	.206	177	.227	176	.247						
248	118	.104	123	.126	122	.136						
249	118	.115	123	.123	122	.131						

Table XVI: Continuous Flow Hypersonic Tunnel - 4% Model
Nominal Conditions: β = 1.5°, M_∞ = 10.0, Upright, Pressures in psia

Orifice ID	Nominal α									
	-5.0°		0.0°		5.0°		10.0°		15.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
2	92	.201	93	.280	94	.384	95	.510	96	.658
5	178	.420	179	.426	180	.430	181	.426	182	.432
6	178	.527	179	.529	180	.525	181	.521	182	.510
9	92	.733	93	.555	94	.407	95	.303	96	.213
13	124	.279	125	.306	126	.309	127	.310	128	.308
14	124	.379	125	.395	126	.395	127	.390	128	.381
17	92	.678	93	.477	94	.325	95	.231	96	.160
19	124	.190	125	.203	126	.203	127	.204	128	.205
20	124	.278	125	.267	126	.264	127	.260	128	.257
21	92	.150	93	.154	94	.155	95	.155	96	.157
22	92	.197	93	.211	94	.211	95	.210	96	.208
23	124	.118	125	.118	126	.117	127	.117	128	.118
24	124	.171	125	.168	126	.166	127	.164	128	.163
25	124	.114	125	.108	126	.104	127	.101	128	.100
26	124	.144	125	.150	126	.147	127	.143	128	.140
44	178	.366	179	.407	180	.442	181	.475	182	.500
87	178	.275	179	.362	180	.471	181	.590	182	.716
88	178	.324	179	.419	180	.532	181	.656	182	.784
89	178	.098	179	.091	180	.108	181	.167	182	.258
90	178	.081	179	.085	180	.120	181	.193	182	.288
91	49	.097	50	.092	51	.108	52	.174	53	.269
921	92	.845	93	.658	94	.500	95	.382	96	.281
922	92	.259	93	.352	94	.478	95	.628	96	.799
93	92	.135	93	.189	94	.277	95	.382	96	.525
201	49	1.861	50	1.728	51	1.575	52	1.387	53	1.197
202	49	2.064	50	2.003	51	1.938	52	1.822	53	1.671
203	49	2.081	50	2.094	51	2.110	52	2.089	53	2.008
204	49	1.933	50	2.020	51	2.100	52	2.159	53	2.165
205	49	1.500	50	1.684	51	1.855	52	2.011	53	2.126
206	49	1.209	50	1.411	51	1.601	52	1.778	53	1.944
207	49	.977	50	1.169	51	1.356	52	1.531	53	1.717
208	49	.677	50	.839	51	1.010	52	1.186	53	1.392
209	49	1.377	50	1.430	51	1.475	52	1.493	53	1.474
210	49	1.566	50	1.640	51	1.707	52	1.750	53	1.747
211	49	1.780	50	1.873	51	1.957	52	2.022	53	2.029
212	49	1.860	50	1.944	51	2.023	52	2.084	53	2.090

Table XVI(continued)

Nominal Conditions: β = 1.5°, M_∞ = 10.0, Upright, Pressures in psia

Orifice ID	Nominal α									
	-5.0°		0.0°		5.0°		10.0°		15.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
213	49	1.697	50	1.761	51	1.820	52	1.860	53	1.851
214	49	1.527	50	1.570	51	1.605	52	1.621	53	1.596
215	49	.814	50	.632	51	.476	52	.349	53	.259
216	49	.460	50	.496	51	.528	52	.552	53	.565
217	49	.578	50	.616	51	.649	52	.671	53	.680
218	49	.269	50	.365	51	.502	52	.653	53	.820
219	49	.127	50	.134	51	.138	52	.142	53	.146
220	49	.181	50	.189	51	.192	52	.195	53	.199
225	92	.499	93	.345	94	.231	95	.163	96	.113
226	92	1.156	93	.951	94	.766	95	.615	96	.473
227	92	1.285	93	1.103	94	.924	95	.763	96	.599
228	92	1.682	93	1.517	94	1.333	95	1.136	96	.921
229	92	.430	93	.561	94	.712	95	.887	96	1.075
230	92	.110	93	.108	94	.152	95	.225	96	.351
231	124	.789	125	.803	126	.812	127	.799	128	.775
232	124	1.187	125	1.219	126	1.249	127	1.241	128	1.208
233	124	1.333	125	1.352	126	1.372	127	1.356	128	1.313
234	124	.944	125	.945	126	.948	127	.930	128	.901
235	178	.121	179	.140	180	.174	181	.212	182	.253
236	178	.095	179	.114	180	.168	181	.237	182	.312
237	178	.094	179	.094	180	.131	181	.210	182	.314
238	178	.091	179	.094	180	.136	181	.215	182	.322
239	178	.094	179	.095	180	.132	181	.210	182	.313
244	49	.471	50	.343	51	.235	52	.165	53	.129
245	92	.467	93	.325	94	.218	95	.151	96	.104
246	178	.240	179	.237	180	.230	181	.227	182	.225
247	178	.146	179	.156	180	.167	181	.177	182	.183
248	124	.109	125	.108	126	.104	127	.098	128	.093
249	124	.165	125	.163	126	.154	127	.144	128	.135

Table XVI: Continuous Flow Hypersonic Tunnel - 4% Model(continued)
Nominal Conditions: $\beta =$ 1.5°, $M_\infty =$ 10.0, Upright, Pressures in psia

Orifice ID	Nominal α							
	20.0°		25.0°		30.0°		35.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
2	97	.821	100	1.006	99	1.190		
5	186	.422	185	.407	184	.385	183	.360
6	186	.483	185	.452	184	.417	183	.382
9	97	.165	100	.083	99	.072	98	.084
13	129	.305	132	.297	131	.277	130	.254
14	129	.370	132	.346	131	.319	130	.292
17	97	.122	100	.064	99	.059	98	.070
19	129	.207	132	.207	131	.196		
20	129	.253	132	.244	131	.229		
21	97	.159	100	.165	99	.160		
22	97	.208	100	.200	99	.190		
23	129	.122	132	.133	131	.133		
24	129	.165	132	.165	131	.163		
25	129	.102	132	.117	131	.120		
26	129	.140	132	.141	131	.140		
44	186	.516	185	.525	184	.531		
87	186	.857	185	.991	184	1.121	183	1.238
88	186	.921	185	1.048	184	1.174	183	1.282
89	186	.446	185	.586	184	.751		
90	186	.443	185	.593	184	.767		
91	54	.401	57	.581	56	.749		
921	97	.227	100	.122	99	.108	98	.115
922	97	.978	100	1.204	99	1.416		
93	97	.686	100	.867	99	1.051		
201	54	1.010	57	.807	56	.641	55	.500
202	54	1.515	57	1.314	56	1.115	55	.926
203	54	1.897	57	1.720	56	1.518	55	1.308
204	54	2.131	57	2.028	56	1.872	55	1.677
205	54	2.184	57	2.189	56	2.132	55	2.016
206	54	2.071	57	2.152	56	2.175	55	2.152
207	54	1.889	57	2.030	56	2.116	55	2.159
208	54	1.612	57	1.815	56	1.961	55	2.073
209	54	1.428	57	1.345	56	1.233	55	1.100
210	54	1.712	57	1.626	56	1.501	55	1.346
211	54	1.996	57	1.901	56	1.755	55	1.569
212	54	2.053	57	1.954	56	1.808	55	1.626

Table XVI(continued)

Nominal Conditions: $\beta = 1.5^{\circ}$, $M_{\infty} = 10.0$, Upright, Pressures in psia

Orifice ID	Nominal α 20.0° Ref	20.0° Pi	25.0° Ref	25.0° Pi	30.0° Ref	30.0° Pi	35.0° Ref	35.0° Pi
213	54	1.802	57	1.696	56	1.561	55	1.403
214	54	1.536	57	1.431	56	1.310	55	1.173
215	54	.201	57	.121	56	.105	55	.101
216	54	.569	57	.563	56	.546	55	.514
217	54	.678	57	.647	56	.615	55	.569
218	54	.998	57	1.221	56	1.422		
219	54	.148	57	.143	56	.137		
220	54	.200	57	.187	56	.175		
225	97	.090	100	.055	99	.055		
226	97	.383	100	.226	99	.164	98	.143
227	97	.477	100	.328	99	.234	98	.179
228	97	.742	100	.566	99	.432	98	.329
229	97	1.290	100	1.520	99	1.697	98	1.855
230	97	.485	100	.685	99	.866		
231	129	.745	132	.704	131	.645	130	.592
232	129	1.157	132	1.090	131	.993	130	.901
233	129	1.241	132	1.150	131	1.036	130	.930
234	129	.852	132	.791	131	.717	130	.651
235	186	.306	185	.350	184	.395		
236	186	.420	185	.524	184	.637		
237	186	.487	185	.633	184	.803		
238	186	.478	185	.636	184	.818		
239	186	.481	185	.635	184	.819		
244	54	.107	57	.089	56	.096		
245	97	.082	100	.054	99	.056		
246	186	.227	185	.227	184	.226		
247	186	.188	185	.191	184	.197		
248	129	.090	132	.100	131	.105		
249	129	.130	132	.128	131	.130		

Table XVII: Continuous Flow Hypersonic Tunnel - 4% Model
Nominal Conditions: β = -1.5°, M_∞ = 10.0, Upright, Pressures in psia

Orifice ID	Nominal α											
	-5.0°		0.0°		5.0°		10.0°		15.0°		20.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
2	103	.199	104	.278	105	.380	106	.509	107	.654	108	.826
5	187	.505	188	.510	189	.517	190	.517	191	.512	192	.498
6	187	.443	188	.441	189	.441	190	.436	191	.425	192	.409
9	103	.729	104	.554	105	.415	106	.299	107	.218	108	.155
13	134	.365	135	.378	136	.382	137	.381	138	.379	139	.372
14	134	.316	135	.324	136	.323	137	.319	138	.315	139	.307
17	103	.675	104	.476	105	.331	106	.227	107	.163	108	.114
19	134	.265	135	.262	136	.258	137	.258	138	.259	139	.260
20	134	.221	135	.212	136	.207	137	.205	138	.205	139	.204
21	103	.203	104	.199	105	.200	106	.200	107	.200	108	.203
22	103	.198	104	.174	105	.168	106	.165	107	.164	108	.165
23	134	.162	135	.157	136	.154	137	.153	138	.155	139	.158
24	134	.135	135	.130	136	.126	137	.124	138	.125	139	.127
25	134	.163	135	.148	136	.137	137	.131	138	.131	139	.132
26	134	.149	135	.131	136	.118	137	.111	138	.109	139	.109
44	187	.296	188	.331	189	.363	190	.392	191	.417	192	.433
87	187	.303	188	.399	189	.519	190	.644	191	.784	192	.923
88	187	.281	188	.365	189	.471	190	.585	191	.711	192	.835
89	187	.105	188	.094	189	.106	190	.163	191	.278	192	.390
90	187	.082	188	.082	189	.104	190	.171	191	.276	192	.390
91	59	.095	60	.087	61	.105	62	.171	63	.275	64	.402
921	103	.837	104	.656	105	.508	106	.377	107	.286	108	.215
922	103	.254	104	.349	105	.474	106	.627	107	.799	108	.995
93	103	.146	104	.190	105	.271	106	.384	107	.521	108	.684
201	59	1.875	60	1.734	61	1.589	62	1.398	63	1.205	64	.999
202	59	2.083	60	2.015	61	1.950	62	1.837	63	1.689	64	1.511
203	59	2.097	60	2.104	61	2.116	62	2.104	63	2.025	64	1.897
204	59	1.947	60	2.027	61	2.102	62	2.172	63	2.182	64	2.136
205	59	1.514	60	1.690	61	1.852	62	2.027	63	2.144	64	2.193
206	59	1.223	60	1.417	61	1.596	62	1.791	63	1.963	64	2.081
207	59	.988	60	1.171	61	1.345	62	1.539	63	1.734	64	1.898
208	59	.684	60	.840	61	.999	62	1.189	63	1.408	64	1.624
209	59	1.492	60	1.541	61	1.579	62	1.608	63	1.589	64	1.531
210	59	1.664	60	1.733	61	1.794	62	1.851	63	1.851	64	1.802
211	59	1.843	60	1.929	61	2.007	62	2.084	63	2.094	64	2.049
212	59	1.829	60	1.905	61	1.979	62	2.052	63	2.059	64	2.010

Table XVII(continued)

Nominal Conditions: $\beta = -1.5^{\circ}$, $M_{\infty} =$ 10.0, Upright, Pressures in psia

Orifice ID	Nominal α -5.0° Ref	-5.0° Pi	0.0° Ref	0.0° Pi	5.0° Ref	5.0° Pi	10.0° Ref	10.0° Pi	15.0° Ref	15.0° Pi	20.0° Ref	20.0° Pi
213	59	1.627	60	1.684	61	1.736	62	1.785	63	1.776	64	1.715
214	59	1.441	60	1.477	61	1.507	62	1.531	63	1.504	64	1.434
215	59	.829	60	.643	61	.490	62	.355	63	.257	64	.202
216	59	.547	60	.586	61	.619	62	.648	63	.663	64	.661
217	59	.495	60	.529	61	.555	62	.577	63	.589	64	.584
218	59	.276	60	.376	61	.500	62	.656	63	.830	64	1.018
219	59	.170	60	.180	61	.183	62	.188	63	.193	64	.194
220	59	.141	60	.147	61	.148	62	.151	63	.155	64	.156
225	103	.498	104	.344	105	.235	106	.160	107	.115	108	.085
226	103	1.142	104	.947	105	.774	106	.610	107	.480	108	.368
227	103	1.270	104	1.096	105	.931	106	.757	107	.604	108	.464
228	103	1.671	104	1.508	105	1.341	106	1.130	107	.929	108	.741
229	103	.425	104	.555	105	.704	106	.885	107	1.078	108	1.310
230	103	.144	104	.121	105	.152	106	.230	107	.344	108	.500
231	134	.886	135	.901	136	.909	137	.900	138	.879	139	.843
232	134	1.281	135	1.322	136	1.347	137	1.350	138	1.321	139	1.267
233	134	1.232	135	1.253	136	1.258	137	1.252	138	1.211	139	1.141
234	134	.838	135	.842	136	.837	137	.826	138	.800	139	.757
235	187	.147	188	.176	189	.218	190	.265	191	.312	192	.358
236	187	.107	188	.132	189	.194	190	.277	191	.367	192	.469
237	187	.100	188	.099	189	.131	190	.216	191	.345	192	.471
238	187	.096	188	.097	189	.130	190	.214	191	.339	192	.468
239	187	.099	188	.097	189	.123	190	.200	191	.321	192	.444
244	59	.478	60	.327	61	.234	62	.166	63	.124	64	.105
245	103	.468	104	.325	105	.222	106	.148	107	.106	108	.078
246	187	.298	188	.293	189	.289	190	.284	191	.279	192	.277
247	187	.184	188	.200	189	.215	190	.229	191	.238	192	.237
248	134	.156	135	.150	136	.140	137	.131	138	.125	139	.122
249	134	.137	135	.129	136	.119	137	.110	138	.105	139	.102

Table XVII: Continuous Flow Hypersonic Tunnel - 4% Model(continued)
Nominal Conditions: β = -1.5°, M_{∞} = 10.0, Upright, Pressures in psia

Orifice ID	Nominal α									
	25.0°		30.0°		35.0°		40.0°		45.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
2	19	1.102	112	1.218						
5	197	.479	196	.447	195	.409	194	.382	193	.376
6	197	.384	196	.356	195	.327	194	.312	193	.318
9	19	.098	112	.061	111	.058	110	.063	109	.079
13	150	.362	143	.331	142	.314	141	.313	140	.299
14	150	.297	143	.271	142	.259	141	.269	140	.263
17	19	.082	112	.056	111	.056	110	.061	109	.075
19	150	.255	143	.253						
20	150	.203	143	.190						
21	19	.208	112	.203						
22	19	.163	112	.171						
23	150	.163	143	.167						
24	150	.134	143	.131						
25	150	.128	143	.155						
26	150	.129	143	.126						
44	197	.451	196	.460						
87	197	1.094	196	1.224	195	1.337	194	1.493	193	1.555
88	197	.986	196	1.102	195	1.204	194	1.355	193	1.421
89	197	.632	196	.840						
90	197	.582	196	.760						
91	69	.583	68	.757						
921	19	.143	112	.096	111	.093	110	.096	109	.109
922	19	1.217	112	1.444						
93	19	.868	112	1.072						
201	69	.798	68	.637	67	.506	66	.381	65	.286
202	69	1.300	68	1.102	67	.931	66	.752	65	.583
203	69	1.704	68	1.494	67	1.312	66	1.098	65	.881
204	69	2.020	68	1.838	67	1.671	66	1.455	65	1.184
205	69	2.196	68	2.103	67	2.005	66	1.860	65	1.629
206	69	2.170	68	2.164	67	2.137	66	2.077	65	1.940
207	69	2.054	68	2.125	67	2.152	66	2.140	65	2.070
208	69	1.835	68	1.981	67	2.080	66	2.120	65	2.128
209	69	1.434	68	1.294	67	1.159	66	.996	65	.841
210	69	1.702	68	1.544	67	1.393	66	1.210	65	.996
211	69	1.938	68	1.760	67	1.593	66	1.384	65	1.126
212	69	1.902	68	1.739	67	1.592	66	1.396	65	1.155

Table XVII(continued)

Nominal Conditions: $\beta = -1.5^o$, $M_\infty =$ 10.0, Upright, Pressures in psia

Orifice ID	Nominal α									
	25.0°		30.0°		35.0°		40.0°		45.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
213	69	1.607	68	1.469	67	1.337	66	1.167	65	.975
214	69	1.334	68	1.215	67	1.099	66	.958	65	.815
215	69	.120	68	.102	67	.093	66	.090	65	.097
216	69	.650	68	.624	67	.595	66	.563	65	.549
217	69	.561	68	.537	67	.514	66	.498	65	.484
218	69	1.254	68	1.461						
219	69	.188	68	.178						
220	69	.148	68	.143						
225	19	.063	112	.051						
226	19	.254	112	.158	111	.129	110	.116	109	.119
227	19	.340	112	.230	111	.174	110	.137	109	.129
228	19	.561	112	.433	111	.332	110	.249	109	.186
229	19	1.522	112	1.722	111	1.891	110	2.010	109	2.157
230	19	.675	112	.876						
231	150	.805	143	.722	142	.653	141	.575	140	.510
232	150	1.200	143	1.074	142	.962	141	.839	140	.703
233	150	1.065	143	.956	142	.867	141	.761	140	.637
234	150	.711	143	.644	142	.584	141	.522	140	.467
235	197	.424	196	.469						
236	197	.604	196	.719						
237	197	.687	196	.866						
238	197	.667	196	.849						
239	197	.657	196	.844						
244	69	.085	68	.087						
245	19	.060	112	.054						
246	197	.277	196	.270						
247	197	.248	196	.258						
248	150	.120	143	.134						
249	150	.106	143	.112						

Table XVIII: Continuous Flow Hypersonic Tunnel - 4% Model
Nominal Conditions: β = -3.0°, M_∞ = 10.0, Upright, Pressures in psia

Orifice ID	Nominal α											
	-5.0°		0.0°		5.0°		10.0°		15.0°		20.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
2	27	.218	28	.301	29	.417	30	.551	31	.712	32	.896
5	207	.566	208	.568	209	.573	210	.576	211	.573	206	.564
6	207	.418	208	.410	209	.406	210	.400	211	.391	206	.378
9	27	.729	28	.563	29	.411	30	.294	31	.203	32	.152
13	151	.413	152	.422	153	.427	154	.427	155	.422	156	.414
14	151	.284	152	.291	153	.290	154	.288	155	.283	156	.277
17	27	.673	28	.482	29	.329	30	.226	31	.157	32	.115
19	151	.292	152	.292	153	.291	154	.292	155	.292	156	.293
20	151	.198	152	.187	153	.183	154	.182	155	.181	156	.181
21	27	.210	28	.225	29	.227	30	.226	31	.226	32	.226
22	27	.150	28	.148	29	.147	30	.146	31	.147	32	.149
23	151	.179	152	.177	153	.178	154	.178	155	.180	156	.182
24	151	.118	152	.114	153	.110	154	.109	155	.109	156	.112
25	151	.155	152	.158	153	.154	154	.151	155	.151	156	.153
26	151	.111	152	.105	153	.100	154	.096	155	.094	156	.094
44	207	.275	208	.306	209	.333	210	.359	211	.381	206	.402
87	207	.328	208	.431	209	.554	210	.685	211	.830	206	1.001
88	207	.271	208	.353	209	.454	210	.562	211	.680	206	.820
89	207	.108	208	.097	209	.120	210	.186	211	.284	206	.461
90	207	.084	208	.083	209	.113	210	.177	211	.271	206	.412
91	77	.101	78	.090	79	.104	80	.168	81	.268	82	.402
921	27	.835	28	.666	29	.503	30	.371	31	.268	32	.211
922	27	.257	28	.348	29	.477	30	.625	31	.803	32	.994
93	27	.136	28	.188	29	.276	30	.384	31	.522	32	.678
201	77	1.888	78	1.737	79	1.589	80	1.401	81	1.196	82	.987
202	77	2.095	78	2.019	79	1.951	80	1.842	81	1.683	82	1.501
203	77	2.111	78	2.109	79	2.120	80	2.108	81	2.019	82	1.889
204	77	1.957	78	2.029	79	2.106	80	2.177	81	2.177	82	2.132
205	77	1.522	78	1.688	79	1.856	80	2.028	81	2.142	82	2.195
206	77	1.231	78	1.415	79	1.599	80	1.795	81	1.964	82	2.086
207	77	.995	78	1.170	79	1.348	80	1.542	81	1.738	82	1.904
208	77	.687	78	.839	79	.999	80	1.190	81	1.414	82	1.633
209	77	1.555	78	1.595	79	1.636	80	1.667	81	1.641	82	1.583
210	77	1.718	78	1.779	79	1.843	80	1.902	81	1.895	82	1.848
211	77	1.876	78	1.955	79	2.035	80	2.111	81	2.114	82	2.072
212	77	1.812	78	1.881	79	1.956	80	2.029	81	2.026	82	1.979

Table XVIII(continued)

Nominal Conditions: $\beta = -3.0^{o}$, $M_{\infty} =$ 10.0, Upright, Pressures in psia

Orifice ID	Nominal α											
	-5.0°		0.0°		5.0°		10.0°		15.0°		20.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
213	77	1.593	78	1.641	79	1.692	80	1.741	81	1.722	82	1.664
214	77	1.396	78	1.427	79	1.454	80	1.480	81	1.444	82	1.377
215	77	.837	78	.651	79	.493	80	.359	81	.261	82	.203
216	77	.591	78	.633	79	.670	80	.702	81	.716	82	.713
217	77	.444	78	.483	79	.509	80	.531	81	.540	82	.538
218	77	.274	78	.375	79	.505	80	.658	81	.835	82	1.034
219	77	.193	78	.207	79	.212	80	.217	81	.221	82	.222
220	77	.123	78	.128	79	.130	80	.132	81	.135	82	.137
225	27	.494	28	.349	29	.231	30	.158	31	.109	32	.084
226	27	1.134	28	.957	29	.770	30	.607	31	.466	32	.363
227	27	1.264	28	1.104	29	.926	30	.755	31	.598	32	.459
228	27	1.666	28	1.514	29	1.335	30	1.127	31	.928	32	.731
229	27	.428	28	.556	29	.708	30	.883	31	1.084	32	1.305
230	27	.111	28	.112	29	.152	30	.236	31	.361	32	.500
231	151	.951	152	.957	153	.969	154	.969	155	.943	156	.903
232	151	1.355	152	1.377	153	1.408	154	1.423	155	1.391	156	1.331
233	151	1.201	152	1.203	153	1.210	154	1.210	155	1.162	156	1.089
234	151	.800	152	.792	153	.788	154	.780	155	.751	156	.709
235	207	.169	208	.205	209	.253	210	.301	211	.354	206	.415
236	207	.115	208	.150	209	.223	210	.300	211	.401	206	.526
237	207	.104	208	.104	209	.156	210	.244	211	.359	206	.528
238	207	.098	208	.099	209	.149	210	.232	211	.344	206	.501
239	207	.101	208	.098	209	.137	210	.215	211	.319	206	.478
244	77	.472	78	.338	79	.238	80	.166	81	.128	82	.107
245	27	.463	28	.328	29	.219	30	.146	31	.100	32	.077
246	207	.344	208	.335	209	.329	210	.324	211	.321	206	.322
247	207	.215	208	.235	209	.252	210	.268	211	.278	206	.281
248	151	.177	152	.172	153	.163	154	.154	155	.147	156	.143
249	151	.114	152	.110	153	.103	154	.096	155	.092	156	.089

Table XVIII: Continuous Flow Hypersonic Tunnel - 4% Model(continued)
Nominal Conditions: β = -3.0°, M_∞ = 10.0, Upright, Pressures in psia

Orifice ID	Nominal α 25.0° Ref	Pi	30.0° Ref	Pi	35.0° Ref	Pi	40.0° Ref	Pi	45.0° Ref	Pi
2	18	1.118	36	1.328						
5	205	.542	215	.492	214	.448	213	.418	212	.400
6	205	.360	215	.318	214	.292	213	.283	212	.287
9	18	.103	36	.064	35	.061	34	.063	33	.075
13	161	.386	160	.360	159	.346	158	.346	157	.281
14	161	.251	160	.239	159	.237	158	.253	157	.202
17	18	.089	36	.065	35	.064	34	.067	33	.079
19	161	.289	160	.285						
20	161	.178	160	.177						
21	18	.222	36	.220						
22	18	.153	36	.167						
23	161	.191	160	.194						
24	161	.118	160	.121						
25	161	.182	160	.194						
26	161	.117	160	.122						
44	205	.420	215	.413						
87	205	1.168	215	1.272	214	1.378	213	1.536	212	1.535
88	205	.959	215	1.035	214	1.128	213	1.291	212	1.305
89	205	.618	215	.793						
90	205	.569	215	.725						
91	83	.566	87	.757						
921	18	.143	36	.106	35	.102	34	.101	33	.108
922	18	1.233	36	1.451						
93	18	.876	36	1.084						
201	83	.802	87	.637	86	.504	85	.380	84	.283
202	83	1.299	87	1.109	86	.930	85	.747	84	.567
203	83	1.697	87	1.500	86	1.311	85	1.091	84	.850
204	83	2.004	87	1.837	86	1.670	85	1.441	84	1.131
205	83	2.180	87	2.096	86	2.005	85	1.850	84	1.565
206	83	2.157	87	2.154	86	2.132	85	2.072	84	1.881
207	83	2.040	87	2.118	86	2.142	85	2.140	84	2.026
208	83	1.826	87	1.981	86	2.062	85	2.115	84	2.100
209	83	1.475	87	1.332	86	1.193	85	1.029	84	.843
210	83	1.732	87	1.577	86	1.426	85	1.236	84	.982
211	83	1.946	87	1.776	86	1.612	85	1.389	84	1.089
212	83	1.865	87	1.720	86	1.567	85	1.367	84	1.097

Table XVIII(continued)

Nominal Conditions: $\beta = -3.0^{\circ}$, $M_{\infty} =$ 10.0, Upright, Pressures in psia

Ori- fice ID	Nominal α									
	25.0°		30.0°		35.0°		40.0°		45.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
213	83	1.562	87	1.435	86	1.299	85	1.130	84	.925
214	83	1.284	87	1.176	86	1.059	85	.922	84	.774
215	83	.157	87	.098	86	.089	85	.084	84	.087
216	83	.697	87	.669	86	.634	85	.592	84	.566
217	83	.522	87	.497	86	.479	85	.466	84	.462
218	83	1.252	87	1.476						
219	83	.215	87	.199						
220	83	.132	87	.127						
225	18	.069	36	.054						
226	18	.242	36	.158	35	.130	34	.117	33	.117
227	18	.332	36	.231	35	.177	34	.142	33	.131
228	18	.567	36	.431	35	.332	34	.250	33	.192
229	18	1.536	36	1.726	35	1.873	34	1.995	33	2.102
230	18	.677	36	.871						
231	161	.849	160	.770	159	.702	158	.623	157	.557
232	161	1.220	160	1.102	159	.997	158	.868	157	.724
233	161	.993	160	.915	159	.823	158	.719	157	.609
234	161	.006	160	.006	159	.005	158	.006	157	.385
235	205	.472	215	.509						
236	205	.655	215	.757						
237	205	.700	215	.862						
238	205	.678	215	.841						
239	205	.646	215	.813						
244	83	.091	87	.083						
245	18	.066	36	.055						
246	205	.320	215	.302						
247	205	.275	215	.278						
248	161	.172	160	.177						
249	161	.114	160	.120						

Table XIX: Continuous Flow Hypersonic Tunnel - 4% Model
Nominal Conditions: β = 3.0°, M_∞ = 10.0, Upright, Pressures in psia

Orifice ID	Nominal α													
	-5.0°		0.0°		5.0°		10.0°		15.0°		20.0°		25.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
2	21	.224	22	.305	23	.418	24	.555	25	.713	26	.883	20	1.083
5	198	.378	199	.382	200	.389	201	.393	202	.393	203	.386	204	.403
6	198	.569	199	.566	200	.565	201	.555	202	.542	203	.515	204	.511
9	21	.720	22	.550	23	.402	24	.295	25	.211	26	.145	20	.096
13	144	.255	145	.278	146	.280	147	.280	148	.281	149	.280	133	.277
14	144	.426	145	.440	146	.437	147	.429	148	.421	149	.407	133	.378
17	21	.662	22	.472	23	.319	24	.224	25	.159	26	.109	20	.078
19	144	.173	145	.182	146	.182	147	.182	148	.184	149	.187	133	.199
20	144	.314	145	.303	146	.297	147	.292	148	.289	149	.283	133	.270
21	21	.140	22	.139	23	.138	24	.138	25	.139	26	.143	20	.164
22	21	.222	22	.238	23	.239	24	.238	25	.236	26	.235	20	.213
23	144	.109	145	.106	146	.105	147	.104	148	.105	149	.109	133	.123
24	144	.199	145	.194	146	.191	147	.188	148	.188	149	.188	133	.185
25	144	.109	145	.099	146	.093	147	.091	148	.090	149	.092	133	.111
26	144	.166	145	.175	146	.169	147	.164	148	.162	149	.161	133	.149
44	198	.399	199	.440	200	.478	201	.509	202	.534	203	.548	204	.588
87	198	.254	199	.338	200	.442	201	.557	202	.682	203	.806	204	1.008
88	198	.339	199	.440	200	.555	201	.678	202	.811	203	.936	204	1.139
89	198	.100	199	.090	200	.103	201	.164	202	.250	203	.373	204	.586
90	198	.081	199	.085	200	.118	201	.197	202	.294	203	.424	204	.632
91	70	.099	71	.091	72	.105	73	.164	74	.261	75	.404	76	.568
921	21	.831	22	.654	23	.494	24	.374	25	.279	26	.205	20	.142
922	21	.257	22	.343	23	.469	24	.618	25	.784	26	.972	20	1.186
93	21	.139	22	.194	23	.278	24	.386	25	.523	26	.687	20	.874
201	70	1.891	71	1.737	72	1.570	73	1.392	74	1.190	75	.995	76	.820
202	70	2.098	71	2.011	72	1.928	73	1.822	74	1.661	75	1.495	76	1.325
203	70	2.115	71	2.103	72	2.099	73	2.088	74	1.997	75	1.876	76	1.732
204	70	1.966	71	2.028	72	2.090	73	2.156	74	2.154	75	2.113	76	2.036
205	70	1.526	71	1.690	72	1.845	73	2.004	74	2.114	75	2.172	76	2.192
206	70	1.228	71	1.415	72	1.592	73	1.770	74	1.929	75	2.063	76	2.152
207	70	.995	71	1.173	72	1.350	73	1.528	74	1.704	75	1.885	76	2.031
208	70	.689	71	.842	72	1.007	73	1.184	74	1.381	75	1.610	76	1.815
209	70	1.348	71	1.386	72	1.418	73	1.443	74	1.419	75	1.372	76	1.305
210	70	1.549	71	1.604	72	1.656	73	1.705	74	1.697	75	1.659	76	1.594
211	70	1.785	71	1.856	72	1.925	73	1.994	74	1.994	75	1.957	76	1.886
212	70	1.915	71	1.974	72	2.034	73	2.102	74	2.101	75	2.057	76	1.982

Table XIX(continued)

Nominal Conditions: β = 3.0°, M_∞ = 10.0, Upright, Pressures in psia

Orifice ID	Nominal α													
	-5.0°		0.0°		5.0°		10.0°		15.0°		20.0°		25.0°	
	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi	Ref	Pi
213	70	1.766	71	1.808	72	1.852	73	1.898	74	1.882	75	1.826	76	1.744
214	70	1.602	71	1.625	72	1.647	73	1.669	74	1.637	75	1.571	76	1.486
215	70	.823	71	.631	72	.474	73	.351	74	.260	75	.198	76	.159
216	70	.428	71	.458	72	.486	73	.510	74	.522	75	.527	76	.525
217	70	.637	71	.668	72	.697	73	.720	74	.726	75	.721	76	.700
218	70	.272	71	.364	72	.496	73	.649	74	.816	75	1.000	76	1.208
219	70	.113	71	.117	72	.120	73	.123	74	.127	75	.129	76	.127
220	70	.207	71	.214	72	.216	73	.219	74	.222	75	.221	76	.215
225	21	.487	22	.343	23	.227	24	.159	25	.113	26	.081	20	.060
226	21	1.142	22	.946	23	.761	24	.607	25	.471	26	.356	20	.255
227	21	1.271	22	1.095	23	.918	24	.755	25	.599	26	.461	20	.341
228	21	1.663	22	1.504	23	1.323	24	1.122	25	.919	26	.739	20	.568
229	21	.432	22	.555	23	.711	24	.885	25	1.064	26	1.275	20	1.499
230	21	.111	22	.113	23	.159	24	.236	25	.355	26	.510	20	.683
231	144	.742	145	.759	146	.761	147	.751	148	.736	149	.706	133	.662
232	144	1.140	145	1.175	146	1.194	147	1.190	148	1.167	149	1.113	133	1.040
233	144	1.396	145	1.412	146	1.419	147	1.410	148	1.376	149	1.295	133	1.197
234	144	1.008	145	1.009	146	1.004	147	.987	148	.961	149	.906	133	.837
235	198	.110	199	.124	200	.152	201	.189	202	.227	203	.269	204	.341
236	198	.090	199	.104	200	.149	201	.216	202	.287	203	.378	204	.525
237	198	.095	199	.092	200	.121	201	.203	202	.303	203	.434	204	.647
238	198	.092	199	.093	200	.127	201	.210	202	.314	203	.448	204	.663
239	198	.095	199	.095	200	.127	201	.210	202	.311	203	.445	204	.665
244	70	.476	71	.344	72	.239	73	.172	74	.134	75	.107	76	.094
245	21	.455	22	.322	23	.215	24	.147	25	.104	26	.074	20	.057
246	198	.210	199	.208	200	.205	201	.202	202	.201	203	.202	204	.218
247	198	.131	199	.137	200	.145	201	.155	202	.161	203	.162	204	.172
248	144	.098	145	.094	146	.089	147	.085	148	.082	149	.080	133	.092
249	144	.192	145	.189	146	.177	147	.166	148	.157	149	.149	133	.140

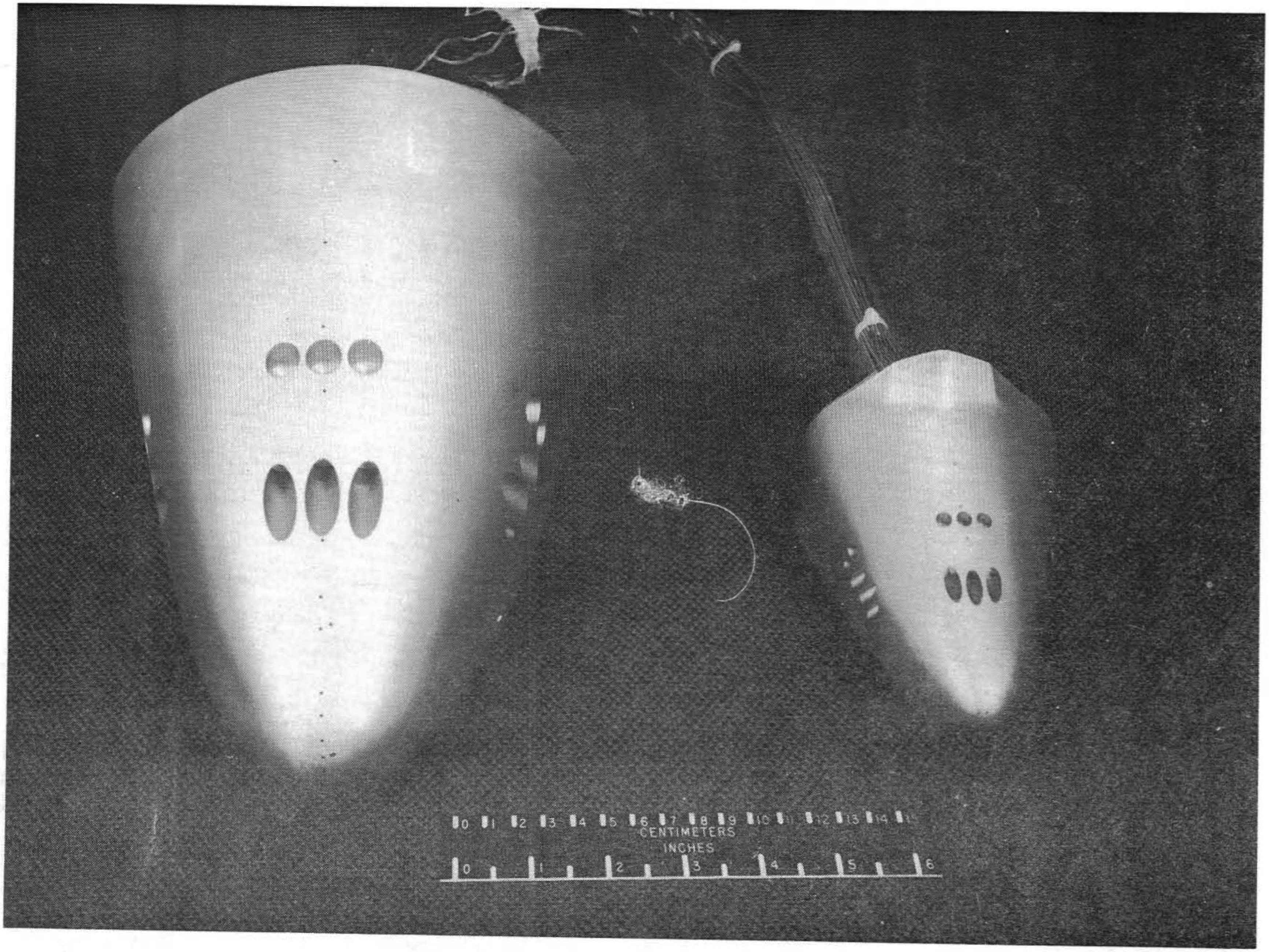

Figure 1. - Photograph of models (top view).

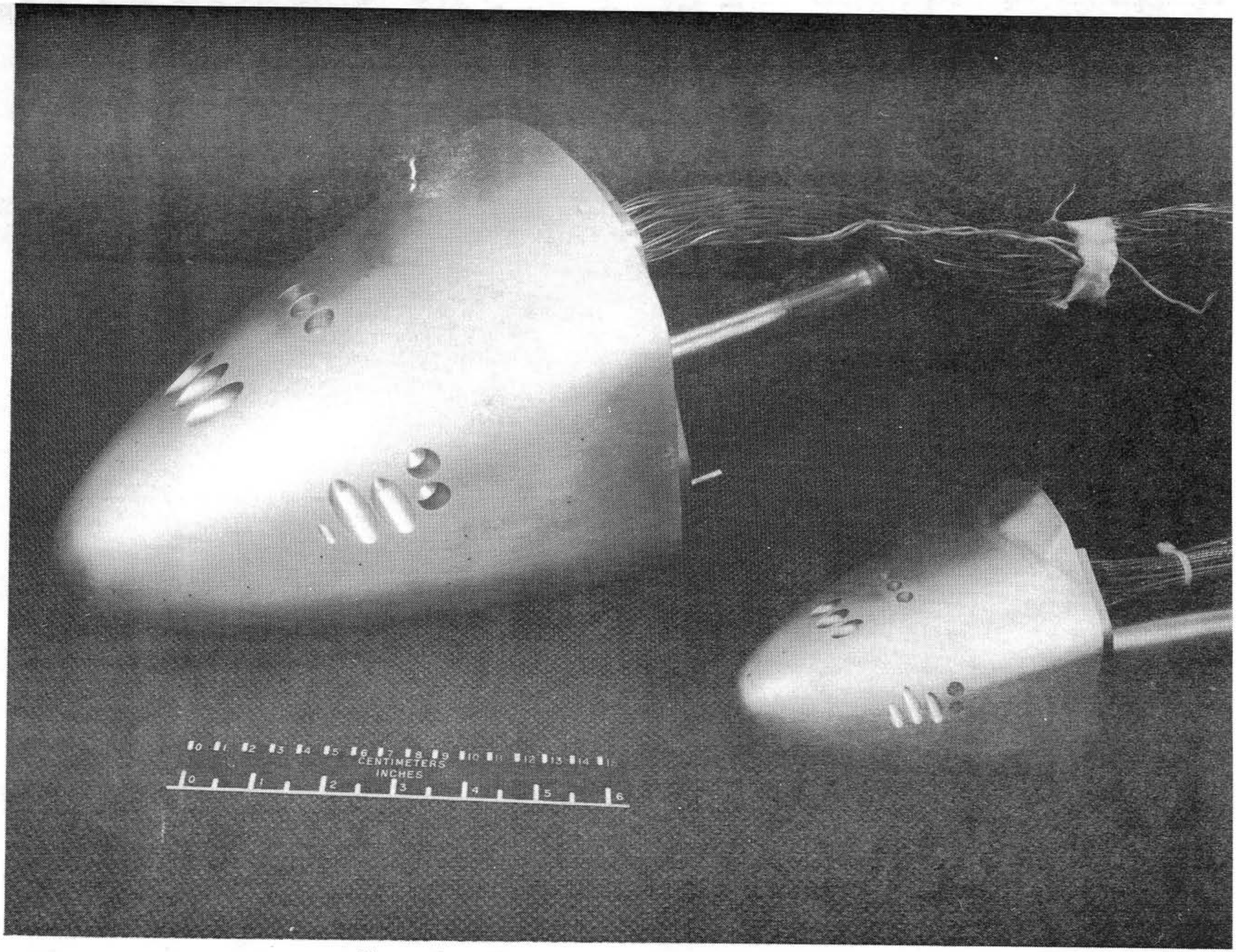

Figure 2. - Photograph of models (side view).

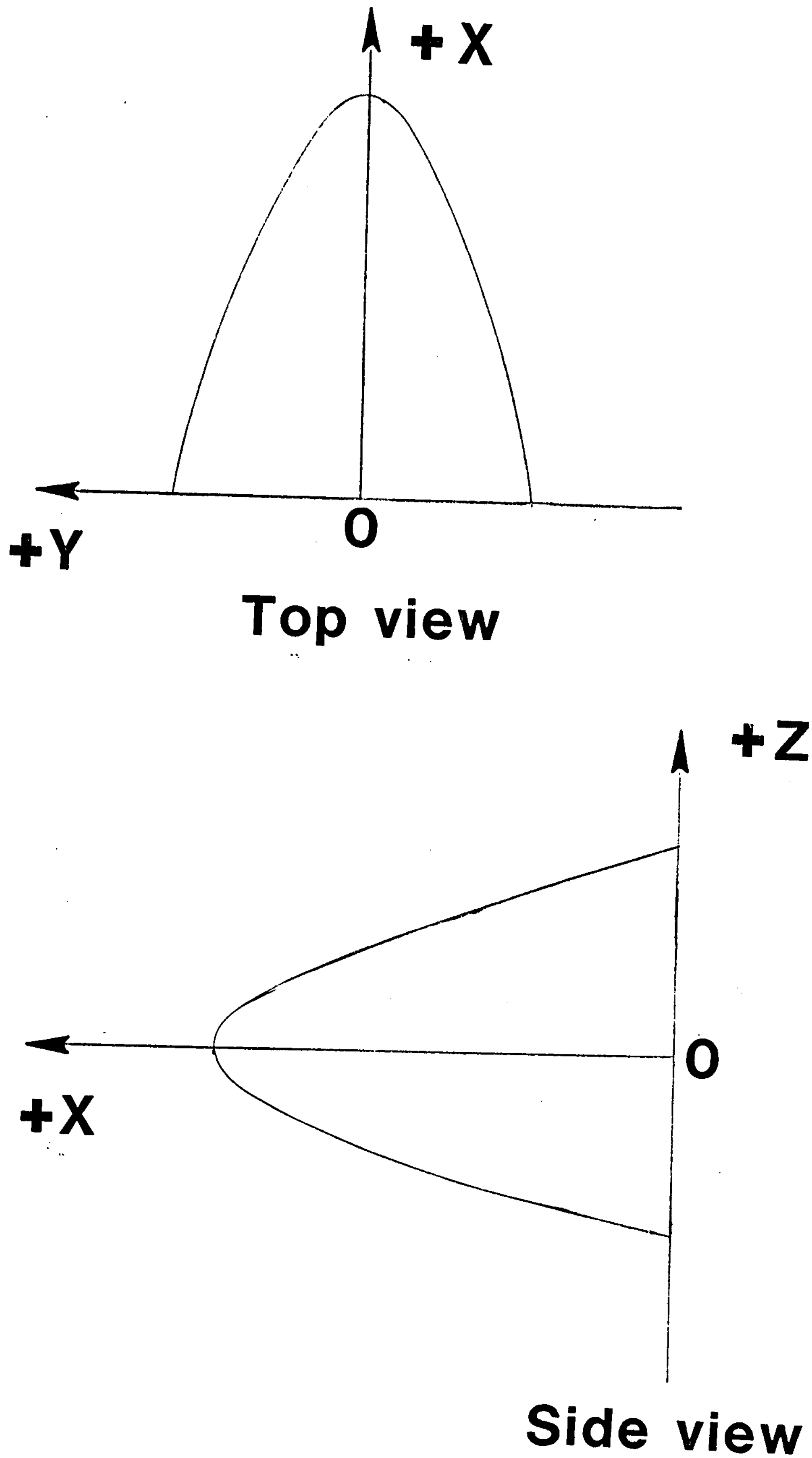

Figure 3. - Models' coordinate system.

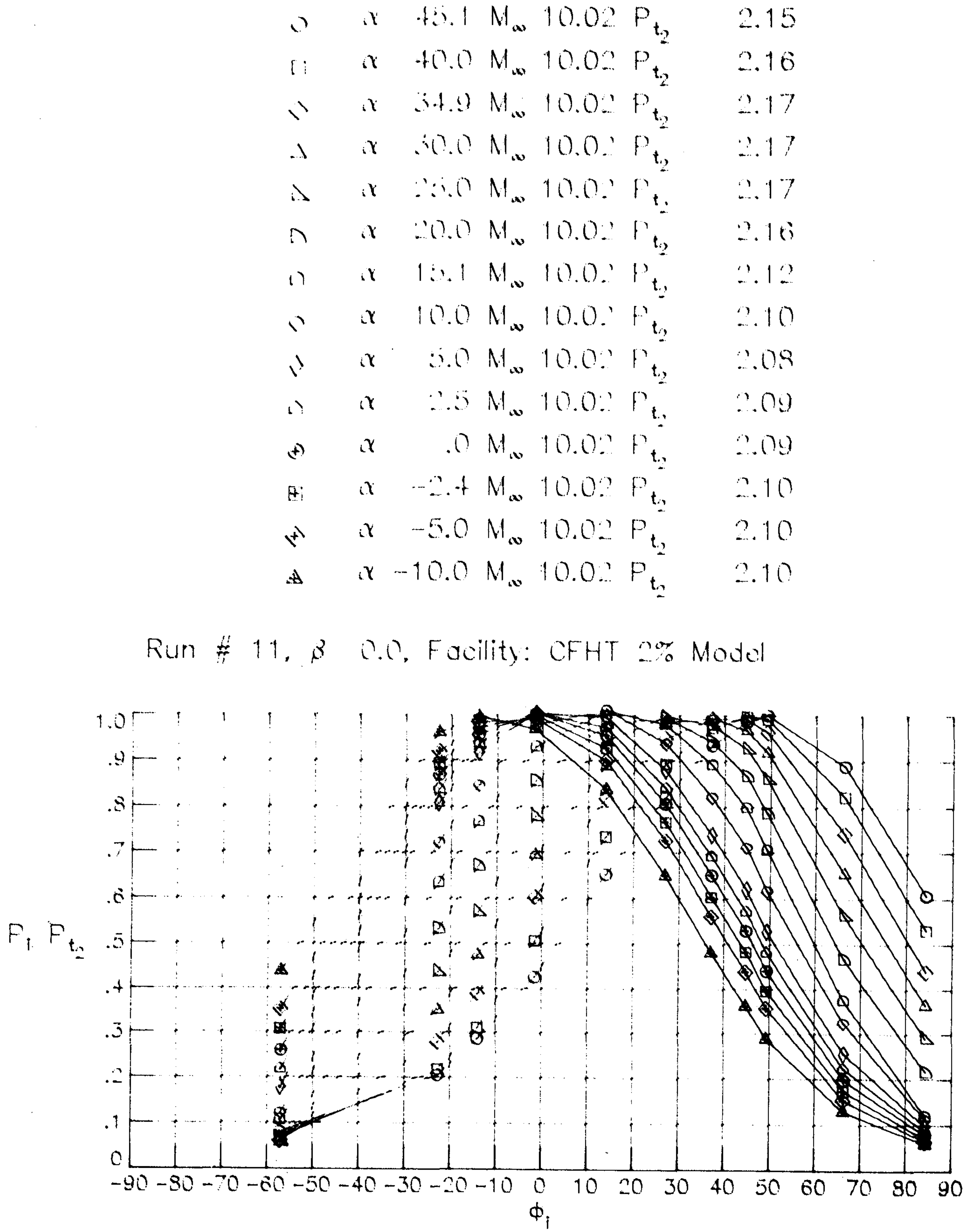

Figure 4. - Sample data, 2% model, β = 0., longitudinal sweep.

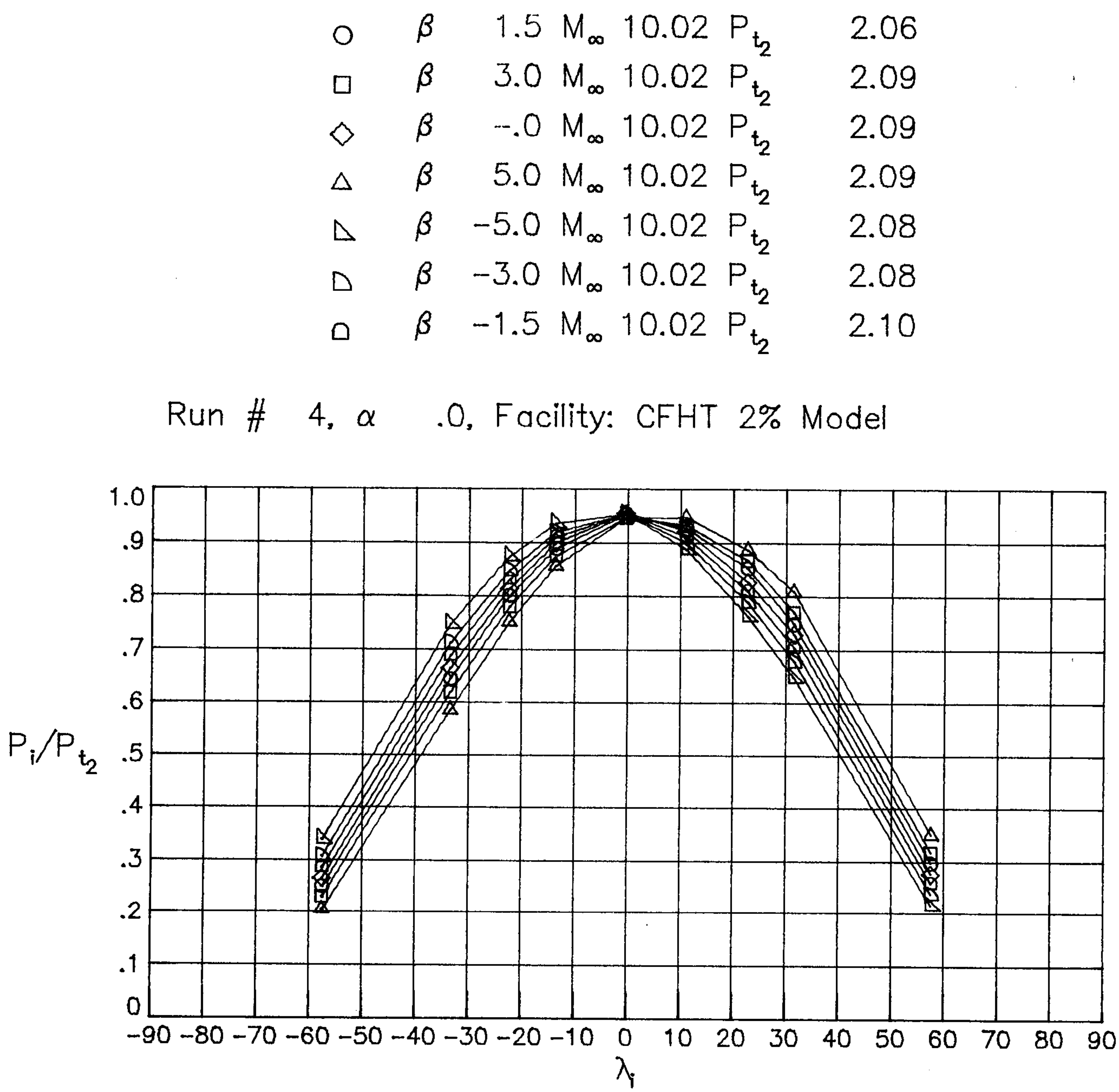

Figure 5. - Sample data, 2% model, α = 0., lateral sweep.

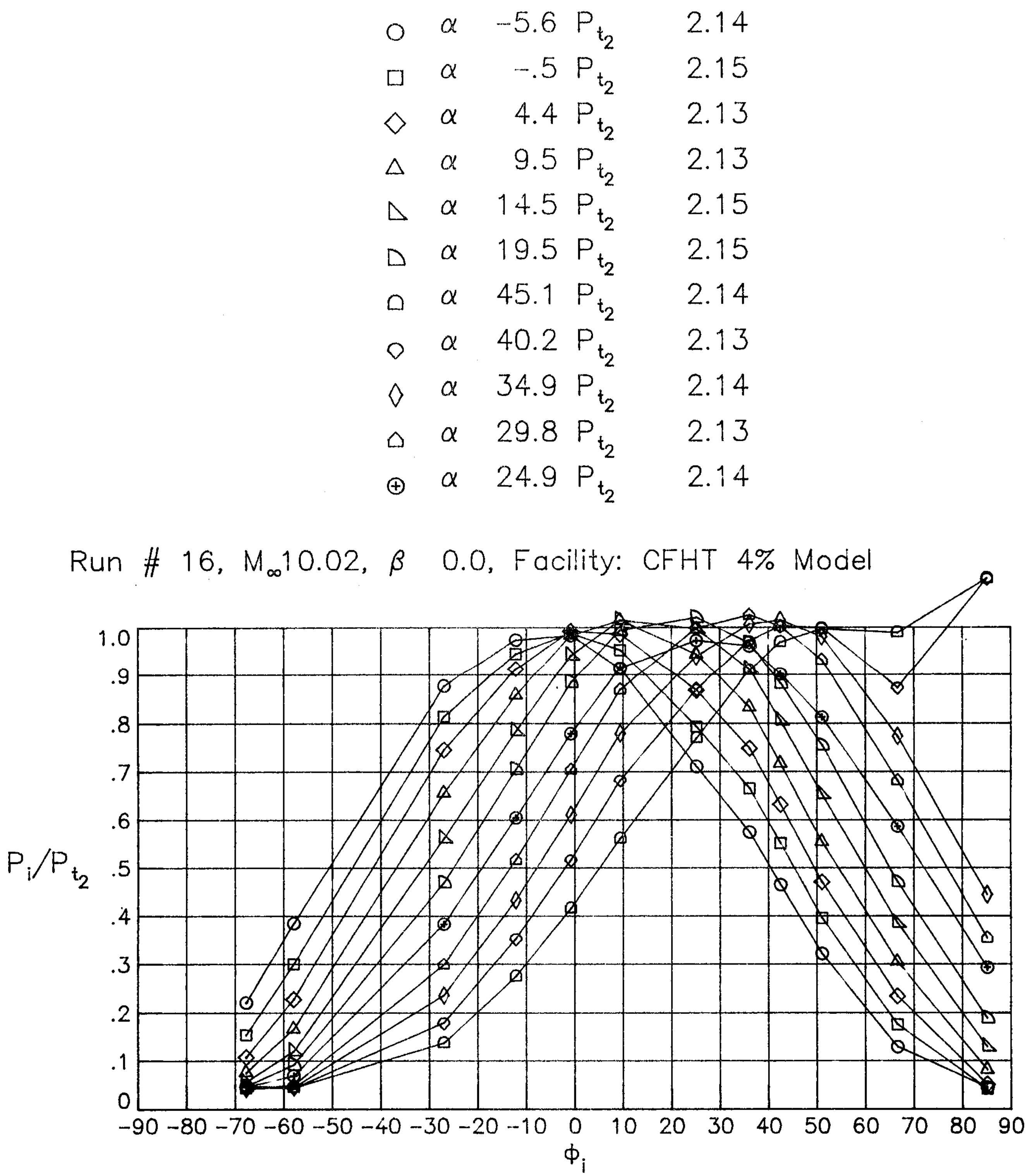

Figure 6. - Sample data, 4% model, β = 0., longitudinal sweep.

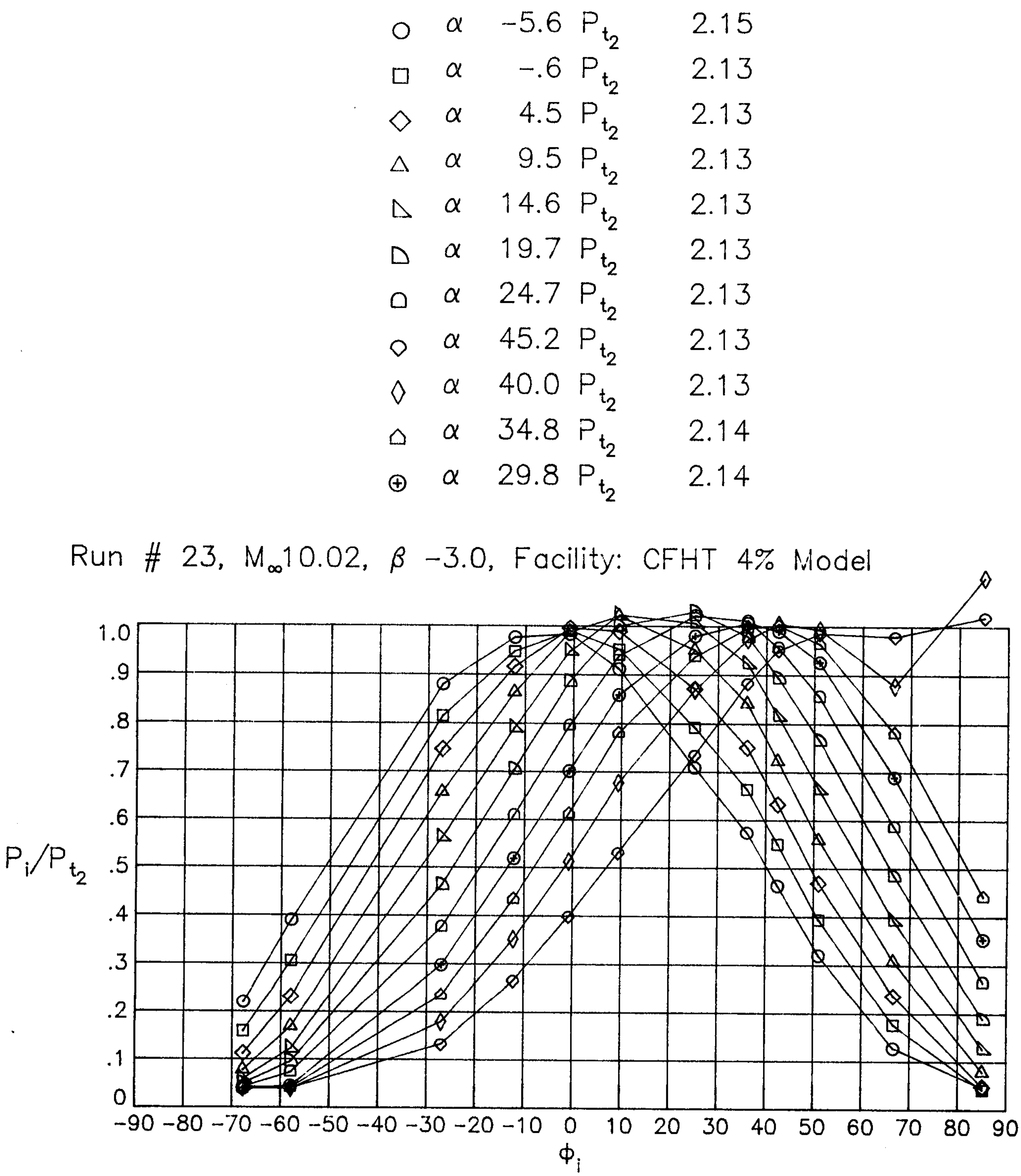

Figure 7. - Sample data, 4% model, β = -3., longitudinal sweep.

○	α	−5.6	M_∞	10.02	P_{t_2}	2.14
□	α	−.5	M_∞	10.02	P_{t_2}	2.15
◇	α	4.4	M_∞	10.02	P_{t_2}	2.13
△	α	9.5	M_∞	10.02	P_{t_2}	2.13
◺	α	14.5	M_∞	10.02	P_{t_2}	2.15
D	α	19.5	M_∞	10.02	P_{t_2}	2.15
⌓	α	45.1	M_∞	10.02	P_{t_2}	2.14
◇	α	40.2	M_∞	10.02	P_{t_2}	2.13
◊	α	34.9	M_∞	10.02	P_{t_2}	2.14
⌂	α	29.8	M_∞	10.02	P_{t_2}	2.13
⊕	α	24.9	M_∞	10.02	P_{t_2}	2.14

Run # 16, β 0.0, Facility: CFHT 4% Model

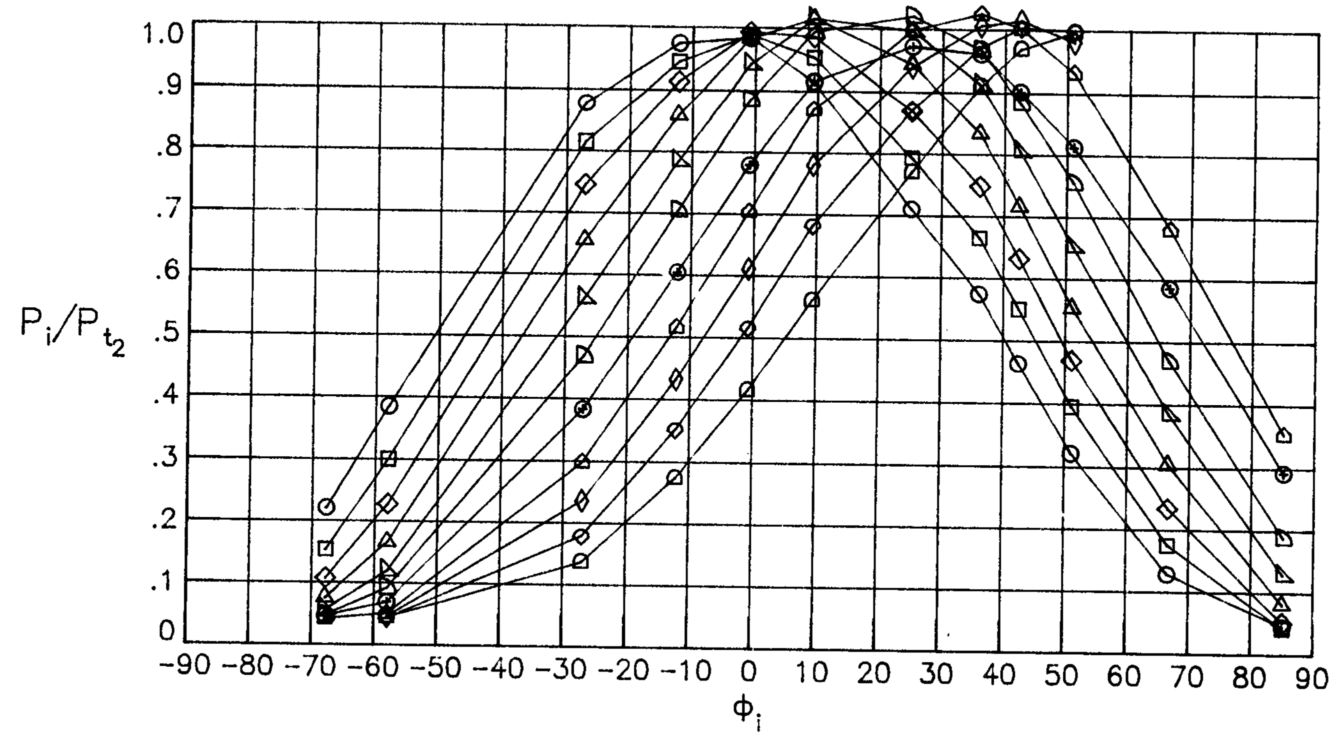

Figure 8. - Sample data, 4% model, β = 0., longitudinal sweep. (contaminated data not plotted)

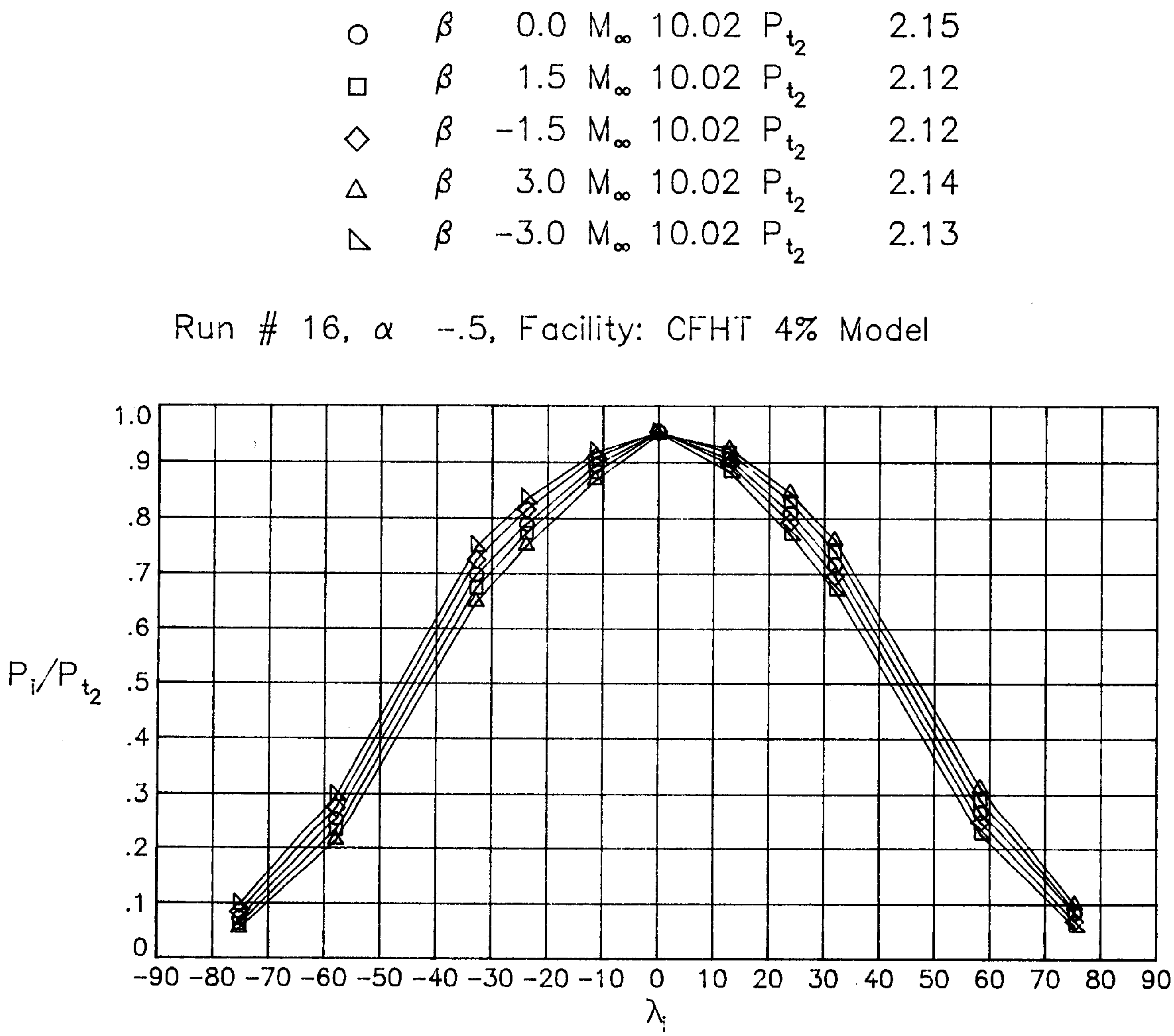

Figure 9. - Sample data, 4% model, α = - 0.5, lateral sweep.

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15. Supplementary Notes

16. Abstract

Results from pressure distribution tests on 0.04-scale and 0.02-scale models of the forward fuselage of the Space Shuttle Orbiter are presented without analysis. The tests were completed in the Langley Continuous Flow Hypersonic Tunnel (CFHT). The 0.04-scale model was tested at angles of attack from -5° to 45° and angles of sideslip from -3° to 3°. The 0.02-scale model was tested at angles of attack from -10° to 45° and angles of sideslip from -5° to 5°.

The tests were conducted in support of the development of the Shuttle Entry Air Data System (SEADS). In addition to modeling the 20 SEADS pressure orifices, the wind-tunnel models were also instrumented with orifices to match Development Flight Instrumentation (DFI) port locations currently existing on the Space Shuttle Orbiter Columbia (OV-102). This DFI simulation has provided a means for comparisons between reentry flight pressure data and wind-tunnel data.

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